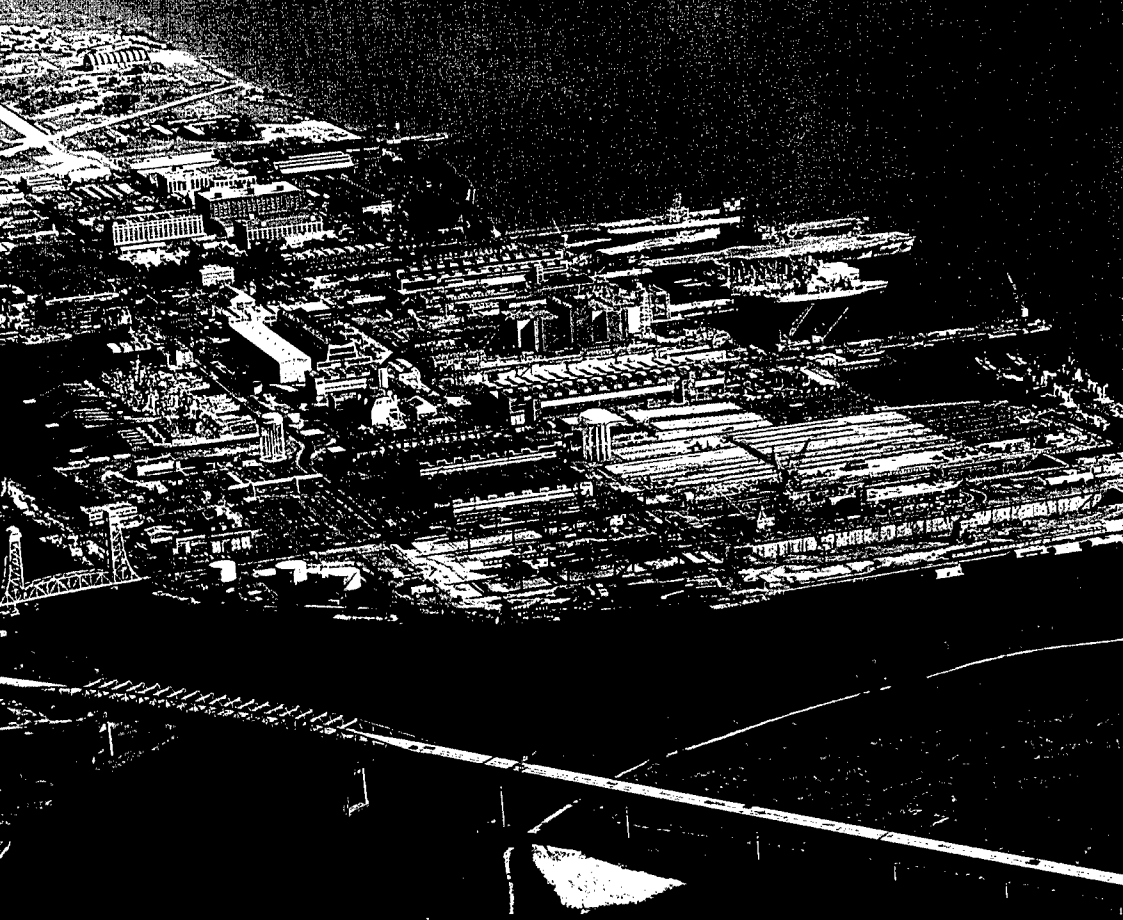


National Defense Research Institute ■ RAND

The Closing and Reuse of the PHILADELPHIA NAVAL SHIPYARD

RON HESS ■ JEFFERSON P. MARQUIS
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In memory of Ron Hess, best of friends, best of analysts

PREFACE

The end of the Cold War has led to major force reductions for all the military services and the closing of numerous military installations and facilities. A number of Office of the Secretary of Defense (OSD) and Navy studies in recent years have examined the economic consequences of closing or contracting shipbuilding facilities. Of particular concern are the costs associated with closing excess facilities and laying off the workforce and then reconstituting those facilities and capabilities and rehiring and retraining the workforce later.

To help understand these costs and economic consequences, the Assistant Secretary of the Navy for Installations and Environment tasked RAND to identify the direct budgetary costs as well as the workforce reconstitution issues associated with closing the Philadelphia Naval Shipyard and the reuse of a major portion of the shipyard for commercial shipbuilding.

This report provides a chronological history of the closing and reuse of the Philadelphia Naval Shipyard with specific data on the costs and workforce issues of closing, maintaining in a dormant state, and reestablishing shipbuilding activities at the shipyard. It also describes the commercial shipbuilding philosophy of the Kvaerner Philadelphia Shipyard and how that philosophy differs from that of U.S. shipbuilders.

This document should be of interest to OSD and Navy policymakers and planners who must face decisions concerning the closing and reuse of shipbuilding facilities. It may also interest industrial decisionmakers involved in the operation of shipyards and the construction of naval and commercial ships.

The research documented in this report was carried out within the Acquisition and Technology Policy Center of RAND's National Defense Research Institute, a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies.

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SUMMARY

BACKGROUND AND PURPOSE

The end of the Cold War left the United States with a larger defense infrastructure than needed to ensure the nation's security in the post-Cold War era. Accordingly, at the instigation of the Defense Department, Congress passed Base Realignment and Closure (BRAC) legislation to enable the department to close, reorganize, or otherwise convert assets to other purposes. Four rounds of BRAC closures ensued, resulting in the closure of 97 of 495 major installations. One of these was the Naval Shipyard in Philadelphia, Pennsylvania.

Although considerable work has been done to examine the economic consequences of closing or scaling back shipyards,¹ these efforts have not had a great deal of quantitative data to examine. Thus, the closure of four shipyards during the BRAC process provided a unique opportunity to gather specific data about costs of closure and reuse of temporarily excess shipbuilding facilities. Recognizing this opportunity, the Navy asked RAND's National Defense Research Institute to develop a case study of the Philadelphia Naval Shipyard (PNSY).

¹See, for example, Birkler, John, et al., *The U.S. Submarine Production Base: An Analysis of Cost, Schedule, and Risk for Selected Force Structures*, Santa Monica, Calif.: RAND, MR-456-OSD, 1994; Birkler, John, et al., *The U.S. Aircraft Carrier Industrial Base: Force Structure, Cost, Schedule, and Technology Issues for CVN 77*, Santa Monica, Calif.: RAND, MR-948.0-Navy/OSD, 1998; and Birkler, John, et al., *Reconstituting a Production Capability: Past Experience, Restart Criteria, and Suggested Policies*, Santa Monica, Calif.: RAND, MR-273-ACQ, 1993. OSD and the Navy also completed a Shipbuilding Industrial Base Study (SIBS) as a follow-on effort to the Quadrennial Defense Review.

The case study has four objectives:

- Lay out the chronology.
- Detail the direct costs of closing the shipyard, maintaining it in a dormant state, and converting it to other uses.
- Examine the ability to reconstitute the workforce for shipbuilding activities.
- Capture the business philosophy of Kvaerner, the shipbuilding company that eventually leased most of the shipyard facilities.

CHRONOLOGY

The decision to close the Philadelphia shipyard was made as part of the 1991 round of BRAC closures. Initially, the yard was to close following the overhaul of the USS *Forrestal*, which was scheduled to finish in 1993. Subsequently, the Navy agreed also to do the more complicated overhaul of the USS *Kennedy*, scheduled for completion in fall 1995. Addition of the *Kennedy* overhaul greatly complicated the closure, because Navy officials had to oversee a complex overhaul while simultaneously preparing the shipyard for closure and transfer. The Navy's schedule of key events for closure and transfer is as follows:

- Establish and staff closure organization (early FY 1992).
- Preserve/secure facilities and plant equipment (FY 1992–FY 1996).
- Environmental cleanup and National Environmental Policy Act (NEPA) efforts (FY 1992–FY 1996).
- Downsize military and civilian personnel (FY 1993–FY 1996).
- Cease mission operations (FY 1994–FY 1995).
- Transfer utility plant operation to Naval Ship Systems Engineering Stations (NAVSSSES) (FY 1994–FY 1995).
- Transfer propeller shop and caretaker functions to Norfolk Naval Shipyard (FY 1994–FY 1995).

- Relocate unique functions and capabilities to Norfolk Naval Shipyard (FY 1995).
- Consolidate residual personnel (FY 1996).
- Cease all operations (FY 1996).

The Navy largely met its schedule. Some of the more complex cleanup operations extended into 2000, but most activities were completed on time, including the overhaul of the USS *Kennedy*, which finished two days early.

The major event of the reuse phase began in October 1997, when Kvaerner ASA, a Norwegian shipbuilding company, signed a 99-year lease for the shipyard. Kvaerner agreed to construct four ships in the shipyard and employ at least 700 full-time workers. Construction, initially scheduled for June 1999, actually began in March 2000. Delivery of the first ship is expected in summer 2002.

DIRECT COSTS OF CLOSING, MAINTAINING, AND RESTARTING THE SHIPYARD

Closing the Philadelphia shipyard was an expensive proposition for the Navy. Total costs amounted to almost \$300 million over five years. These costs were borne by two Navy organizations, Naval Sea Systems Command (NAVSEA) and Naval Facilities Engineering Command (NAVFAC). NAVSEA carried the burden of the costs, expending almost \$204 million, of which more than half went to pay costs associated with the civilian workforce (e.g., termination, relocation, etc.). NAVFAC, which spent almost \$88 million, was responsible for the environmental cleanup of the shipyard, and 85 percent of its expenditures were for that purpose. As a point of comparison, the Philadelphia shipyard closing was not the most expensive of the BRAC era. NAVSEA costs alone to close the Mare Island Naval Shipyard, a nuclear facility, exceeded \$420 million.

Our focus was on the costs to shut down and maintain facilities and equipment and then to reopen and reuse those facilities and equipment later. NAVSEA spent almost \$30 million to place the buildings and equipment in a dormant state. This facility and maintenance cost was the highest of the four shipyards closed by BRAC, partly stemming from the number of buildings and facilities and their age

and condition. NAVFAC spent an average of \$3 million per year in personnel, security, and real property maintenance for the shipyard from FY 1997 to the time of transfer. Although not a trivial sum of money, the costs of shutdown and maintenance were relatively low, given the number of facilities and their combined square footage.

The costs of reusing the shipyard, especially the cost of reconstituting the Kvaerner portion of the shipyard, far outweighed the costs of closing the yard and maintaining it in a dormant state. Approximately \$300 million was spent to demolish old, unneeded structures and build and equip modern ship construction facilities on the Kvaerner site. These costs were primarily for the construction of a new fabrication shop (approximately 650,000 square feet), a grand block shop for the assembly of modules weighing up to 600 tons, and a paint shop, plus the purchase of a 600-ton gantry crane (at approximately \$30 million) and other, modern shipbuilding equipment such as cranes, robotic cutters and welders, and medium- and heavy-lift transporters. It is important to note that very little was spent on refurbishing the two large drydocks on the Kvaerner site.

Costs to reuse other parts of the shipyard were lower, but not trivial. One building occupied by a new tenant, Metro Machine, involved in the ship repair business, required more than \$400,000 in renovations to make the building suitable for occupation. Refurbishment costs for other buildings ranged from \$10 to \$90 per square foot, depending on the condition of the building and its intended reuse.

At least two important caveats should be kept in mind when considering these costs:

- Private shipyards may have taken a different approach to shutting down and maintaining facilities and equipment. A private shipyard may have demolished many of the old buildings that had little potential or value for reuse and may have disposed of excess equipment no longer needed. The Navy, under the guidelines of the BRAC process, expended money for the shutdown and maintenance of old facilities and unneeded equipment.
- The reuse of the Kvaerner portion of the shipyard involved the conversion from ship repair to ship construction. The vast majority of the reopening cost for the Kvaerner portion would

not have been necessary if the existing facilities and equipment had been geared toward ship construction.

WORKFORCE-RELATED CLOSING AND RECONSTITUTION COSTS

When the decision to close the PNSY was announced, the shipyard directly employed almost 7,400 people. The closure involved considerable disruption for the workforce, with many being terminated and many others being transferred. When the shipyard finally closed, fewer than 2,000 of the former employees were left unemployed. Many of those had employment opportunities they declined.

On average, NAVSEA spent approximately \$15,000 per employee in separation bonuses, relocation expenses, and retirement incentives. These costs would have been higher if not for two factors. First, the economy in the region was fairly robust in the late 1990s, providing new employment opportunities for the displaced shipyard workforce. Second, new employment opportunities at the shipyard were created by other BRAC actions and by the new tenants that were leasing the excess shipyard property. The several Navy organizations remaining at or relocated to the shipyard provided approximately 2,000 jobs. The new tenants locating at the shipyard created job opportunities for an additional several hundred people.

Key among these new tenants was Kvaerner, whose agreement with the city promised employment for 700 full-time workers, with potential surges up to 900. In addition, since Kvaerner relies on subcontractors for almost 70 percent of the total effort in building a ship, up to 2,000 additional job opportunities should be created in the vendor base that supports the Kvaerner shipbuilding activities.

Kvaerner currently employs more than 500 local workers, of whom more than half are blue-collar workers and the remaining are engineers, designers, planners, or support-related. Approximately 40 percent of the current Kvaerner employees (approximately 60 percent of the blue-collar workers) are former PNSY employees. Finally, other tenants at the shipyard should add several hundred more jobs.

Reconstituting the Kvaerner workforce was not without additional cost. By the time the shipyard reaches full production capacity,

approximately \$187 million will have been spent on overseas, technical, and on-the-job training of the new workforce. This training was directed at the cooperative, multiskilled environment critical to successful commercial shipbuilding. Most of the training money was provided to Kvaerner from the more than \$165 million in federal grants provided to the city for reuse planning and workforce training.

KVAERNER PHILOSOPHY

The creation of the Kvaerner Philadelphia Shipyard marked the first real presence in the United States of a foreign shipbuilder, capable of competing for world markets. Most U.S. shipyards have evolved largely molded by their principal customer, the U.S. government. Starting early in the last decade of the Cold War, new construction in these shipyards has been essentially all for the U.S. Navy. These yards do not have the same competitive atmosphere that drives shipbuilding in the world commercial markets. Consequently, it has proven difficult for the major U.S. yards to compete in the world market.

Kvaerner has been very successful delivering competitively priced ships to the world market. The keys to this success can be attributed to several factors, not necessarily limited to Kvaerner and Europe, that can be thought of as the “European Model.” Key attributes of this model appear below. We note that many of these exist in other U.S. businesses. It is their application in shipbuilding that is the focus here.

Key attributes of Kvaerner’s shipbuilding philosophy include:

- **Multiskilled Workforce**—workers are trained to handle a variety of related skills and are expected to work cooperatively with other craftsmen.
- **Just-in-Time Delivery of Material**—material is delivered from suppliers when needed in the construction schedule. This reduces inventory cost, including facilities to store material.
- **Material Flow**—Kvaerner’s steel fabrication facility adopts the best aspects of all its other shipyards and is geared toward efficient flow of steel pieces and fabricated parts.

- Automation—based on its experience in Europe, Kvaerner has learned that overautomation can be counterproductive. The Philadelphia yard has been automated only where necessary to enhance the efficiency of the operation.
- Modular Construction, Preoutfitting, and Outfitting—Kvaerner has benefited from experience in its other yards and has applied this knowledge to the design of the Philadelphia facilities to optimize the design and procedure for assembly and outfitting of ship modules.
- Use of Prefabricated Components—Kvaerner makes maximum use of prefabricated parts and components.
- Outsourcing Work to Subcontractors—the most effective productivity-enhancing factor employed by Kvaerner is the maximum use of subcontractors, who are tasked to perform a series of specific tasks in a specific geographic area, on a “turnkey” basis.

POLICY OBSERVATIONS

A review of the activities and decisions surrounding the closure and reuse of the Philadelphia Naval Shipyard leads us to make the following observations:

- **Closings are inherently complex and more so when multiple jurisdictions are involved.** Three states (Pennsylvania, New Jersey, and Delaware) and the city of Philadelphia had interests in the fate of the shipyard. Not all of the interests coincided, so the process of negotiating what would happen to the yard, who would pay for what, and where responsibilities began and ended had to be tediously negotiated.
- **The process can be expensive, and the federal government may not recoup much money.** Although there was considerable debate over the value of the shipyard at the time of closure, the Navy evaluated it at approximately \$60 million. The federal government ended up getting \$4 million from Philadelphia. To close the facility and turn it over to the city cost almost \$320 million.

- **Civilian workforces can be more flexible than many believe.** The Metal Trade Union agreed to modify its union work rules substantially to meet Kvaerner's needs. One of the barriers to U.S. companies' being competitive in the global shipbuilding markets has been the high cost of labor. Although it is too early to make firm judgments, the willingness of the workforce to make major adjustments indicates that the cost of American workers need not be an insurmountable entry barrier to commercial shipbuilding.
- **The Navy's approach to closing the Philadelphia Naval Shipyard may be worth emulating.** When all is taken into account, the Navy did an admirable job in closing the yard. The feat is especially noteworthy in light of the Navy's taking on the task of a major ship overhaul while simultaneously closing the base. These two activities required skillful juggling by the Navy's managers. That the base closed on the schedule the Navy set for itself speaks well of the robustness of its plan. It may well have application to other base closure activities.

ACKNOWLEDGMENTS

We are grateful to Hon. Robert B. Pirie, Jr., who was the Assistant Secretary of the Navy for Installations and Environment when he initiated the research effort, and Commander V. W. "Web" Freeman for their support and encouragement throughout the research.

This document contains a wide range of information gathered from numerous reports and articles concerning the closing and reuse of the Philadelphia Naval Shipyard. Several people within and outside of RAND helped identify and obtain the various reports and articles. Primary among these were Debbie Peetz of RAND and Mrs. Edward J. Rosinski of the Philadelphia area.

The published information was supplemented by several interviews with Navy and regional organizations. We are deeply indebted to the following individuals for openly sharing their knowledge and providing data. Within the Naval Facilities Engineering Command, Harry Zimmerman, Howard Kelsey, Don Allen, and David Drozd helped us to understand the processes for closing and transferring Navy installations and how those processes were applied in the case of the Philadelphia Naval Shipyard. Ken Williams of NAVSEA provided information and cost data on NAVSEA's role in the closing of the shipyard. Captain (retired) John Bergner, the last commanding officer of the shipyard, informed us of the actions taken to close and secure facilities and to transition the shipyard workers to new careers. William Hankowsky and Robert Gorgone of the Philadelphia Industrial Development Corporation shared their knowledge and insights about the closure and reuse. Harald Rafdal, then president of the Kvaerner Philadelphia Shipyard, provided valuable informa-

tion on Kvaerner's commercial shipbuilding philosophy and the actions necessary to establish shipbuilding operations. Frank Camm, Harry Thie, and Jerry Sollinger, our colleagues at RAND, provided many helpful suggestions to improve the overall document.

Of course, we alone are responsible for any errors.

ACRONYMS

BFTC	Ben Franklin Technology Center
BRAC	Base Realignment and Closure
CAM	Common Area Maintenance
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNO	Chief of Naval Operations
CNSY	Charleston Naval Shipyard
CSO	Caretaker Site Office
DARPA	Defense Advanced Research Projects Agency
DoD	Department of Defense
DRPA	Delaware River Port Authority
ECF	Economic Conversion Fund
EDA	Economic Development Administration
EDC	Economic development conveyance
EFD	Engineering Field Division
EPA	Environmental Protection Agency
GAO	General Accounting Office
JTPA	Job Training Partnership Act
KPI	Kvaerner Philadelphia Incorporated
LBNSY	Long Beach Naval Shipyard
LBP	Lead-based paint

LRA	Local Redevelopment Authority
MARAD	Maritime Administration
MCAS	Marine Corps Air Station
MINSY	Mare Island Naval Shipyard
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NAVSES	Naval Ship Systems Engineering Station
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NSWC	Naval Surface Warfare Center
ODC	Office of Defense Conversion
OEA	Office of Economic Adjustment
OECD	Organization of Economic Cooperation and Development
OJT	On-the-job training
OSD	Office of the Secretary of Defense
PAID	Philadelphia Authority for Industrial Development
PIC	Private Industry Council
PIDC	Philadelphia Industrial Development Corporation
PNBC	Philadelphia Naval Business Center
PNSY	Philadelphia Naval Shipyard
PPP	Priority Placement Program
PSDC	Philadelphia Shipyard Development Corporation
RIF	Reduction in force
SIBS	Shipbuilding Industrial Base Study
SIP	Separation Incentive Program
SLEP	Service Life Extension Program
TEU	Twenty-foot equivalent units

RATIONALE FOR THE RESEARCH

The end of the Cold War has led to major force structure reductions for all the military services. As a result, large defense corporations have been adjusting their facilities and employment levels to compete in the declining defense market. This is especially true of the six major firms constructing naval ships. A number of Office of the Secretary of Defense (OSD) and Navy studies in recent years have examined the economic consequences of the closing or contraction of shipbuilding facilities.¹ Of particular concern are the costs associated with closing down excess facilities and laying off the workforce and then reconstituting those facilities and capabilities and rehiring and retraining the workforce. Because this has rarely been done until now, past studies of the shipyard closing and reopening issue have been based on speculation; there is meager quantitative analysis and documentation.

At the same time that the defense-related corporations have been adjusting their facilities and employment levels, all the military ser-

¹See, for example, Birkler, John, et al., *The U.S. Submarine Production Base: An Analysis of Cost, Schedule, and Risk for Selected Force Structures*, Santa Monica, Calif.: RAND, MR-456-OSD, 1994; Birkler, John, et al., *The U.S. Aircraft Carrier Industrial Base: Force Structure, Cost, Schedule, and Technology Issues for CVN 77*, Santa Monica, Calif.: RAND, MR-948.0-Navy/OSD, 1998; and Birkler, John, et al., *Reconstituting a Production Capability: Past Experience, Restart Criteria, and Suggested Policies*, Santa Monica, Calif.: RAND, MR-273-ACQ, 1993. OSD and the Navy also completed a Shipbuilding Industrial Base Study (SIBS) as a follow-on effort to the Quadrennial Defense Review.

vices have been closing numerous bases and installations through the Base Realignment and Closure (BRAC) process. Through this process, the Navy has closed four naval shipyards and is in the process of transferring the property and assets to the local communities for reuse. These shipyard closures provide a valuable opportunity to record the costs of closing and reusing major industrial facilities. Recognizing this opportunity, the Assistant Secretary of the Navy for Installations and Environment tasked RAND to develop a case study of the closing and reuse of the Philadelphia Naval Shipyard (PNSY).

OBJECTIVE OF THE RESEARCH

The objective of this report is to document the activities required to close, maintain, and reuse the former PNSY. The report concentrates on the principal current tenant, Kvaerner, as it reopens a portion of the yard to build commercial ships. The research seeks to capture the costs, the schedule, and the workforce impacts of closing and reopening the PNSY. It also seeks to understand the shipbuilding philosophy of Kvaerner, a major international builder of commercial ships, and contrast its philosophy with that of the major U.S. shipbuilders. Lessons should be learned that may help the U.S. shipbuilders regain a competitive edge in the international shipbuilding market.

Of importance are understanding the economic and noneconomic factors considered, the steps taken, and the trade-offs made by the Navy, the city, and Kvaerner in closing, maintaining in a dormant state, and then reopening a major portion of the shipyard. This research should provide the Department of Defense (DoD) and the Navy with insights into the short- and long-term implications, management approaches, and necessary policies pertaining to the closing and reopening of shipyards and other major industrial facilities.

ORGANIZATION OF THE DOCUMENT

The next chapter provides a brief historical background of the PNSY and provides a timeline of the key events in the closing and reuse of the shipyard. Chapter Three outlines the BRAC process, how that process affected the city of Philadelphia, and how the city reacted. Chapter Four briefly describes the city's initial preparations for the

transfer of the shipyard and its efforts to find suitable tenants. Chapter Five describes the Navy BRAC process and how that process was applied in the closing of the PNSY. Chapter Five also provides the costs to the Navy of closing the PNSY. Chapter Six describes the first attempt to bring a commercial shipbuilder, Meyer-Werft, into the shipyard. Chapter Seven provides background on the efforts to reach an agreement with Kvaerner to become the principal tenant at the shipyard. Chapter Eight describes the reopening of the shipyard by Kvaerner and brings the chronology up to the present time. Chapter Nine offers some observations on the closure and reuse process including the lessons for estimating the costs of future shipbuilding industrial base actions, the ability to reconstitute the shipyard workforce, and Kvaerner's commercial shipbuilding philosophy.

Chapter Two

BACKGROUND

PHYSICAL DESCRIPTION OF THE NAVAL COMPLEX

Before it was closed in 1996, the Philadelphia Naval Complex¹ comprised 1,168 acres (almost two square miles), including the Philadelphia Naval Shipyard and Naval Station on the Delaware River waterfront, the Philadelphia Naval Hospital² on an inland site about three-quarters of a mile to the north, and a block of servicemen's housing developed under the Capehart Act in the 1960s on a site adjacent to the hospital. The complex contained more than 1,000 buildings, 52 miles of street, and 4.2 miles of waterfront. Figure 2.1 is a map of the Philadelphia Naval Complex. An appraisal of the shipyard commissioned by the Navy in 1999 concluded that the property had an estimated fair market value of \$56.6 million (U.S. Navy, 1999, pp. 8–9).³

¹Although the focus of our study is on the shipyard, the Navy and especially the city of Philadelphia and the state of Pennsylvania typically considered the overall naval complex in their decisions and negotiations. We will try to the extent possible to concentrate on the costs and policy implications associated with just the shipyard. When it is appropriate, however, we will describe the actions associated with the overall complex.

²The naval hospital was handled separately from the naval station and shipyard. The hospital was closed as a result of the 1988 BRAC.

³The city of Philadelphia strongly disputed the Navy's assumptions and methodology in developing the \$56.6 million estimate of the value of the shipyard. The city argued further that a \$260 million public investment was required to suitably renovate the area of the shipyard ultimately occupied by Kvaerner, the Norwegian company that became the major new tenant.

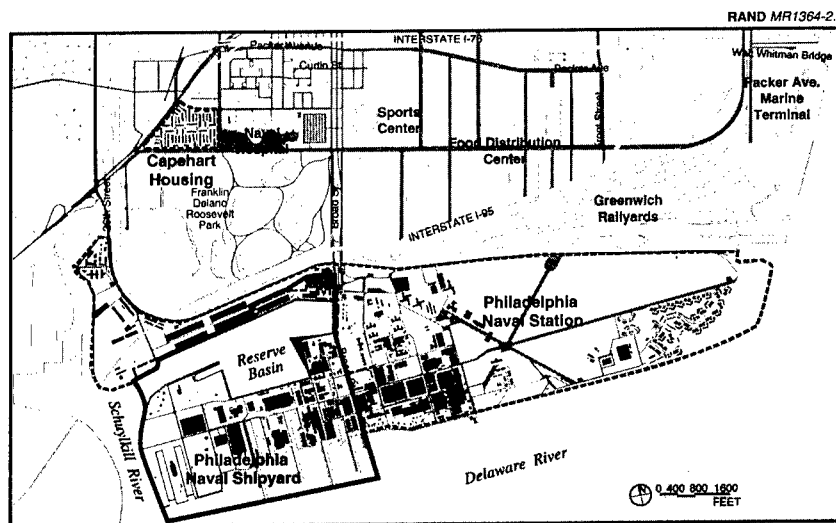


Figure 2.1—The Philadelphia Naval Complex

The Shipyard

Located in South Philadelphia, at the confluence of the Delaware and Schuylkill Rivers, west of Broad Street, the Philadelphia Naval Shipyard was one of the Navy's largest industrial facilities. The PNSY encompassed 300 acres, including 25,000 linear feet of berthing space; five drydocks; and 34 fixed, floating, and track cranes with facilities that housed 23 fully equipped production shops totaling more than seven million square feet of space. The shipyard's most important physical assets were its drydocks, two of which were large enough to handle aircraft carriers. In addition, PNSY supported a complete ship-to-shore waste collection system, the East Coast Naval Tactical Data System Land-Based Test Site, a winch overhaul facility, and the Oil-Free Engineering and Calibration Facility for the East Coast. It also hosted the Navy's only propeller manufacturing facility and the Naval Ship Systems Engineering Station (NAVSSSES), both of which continue to be based in the naval station and shipyard complex (*Investing*, 1993, p. 7; PIDC, 1994, pp. 9–11).

A BRIEF HISTORY OF THE PNSY

The U.S. Navy was born in Philadelphia.⁴ The Continental Congress authorized the construction of one ship-of-the-line and four frigates built there during the Revolutionary War. In 1801, the first government-owned shipyard was established in Philadelphia's Southwark district with \$38,636 in congressionally appropriated funds. The Civil War convinced the Navy of the need for a larger shipyard in Philadelphia. Accordingly, in 1867, Congress passed legislation to relocate the Navy yard to its most recent location, and the city of Philadelphia purchased the so-called League Island site for \$320,000 and donated it to the federal government (Binzen, 1997).

Despite lulls in ship construction, the Navy gradually upgraded PNSY's physical plant in the post-Civil War and inter-World War periods. This activity culminated in the construction of two giant drydocks in the 1890s. Drydock 1 was designed and constructed under the direction of Lieutenant Robert E. Peary, the future Arctic explorer, while Drydock 2 was built in 1898 during the Spanish-American War. In the 1920s and 1930s, the shipyard added a 350-ton hammerhead crane and built the Navy's first and only propeller manufacturing foundry (U.S. Navy, NAVSEA, 1996, pp. 2-4).

PNSY's workforce expanded to meet the demands of the two World Wars. As a result of World War I, employment at the shipyard increased from 2,500 in 1916 to 12,000 in 1919. During World War II, employment at the PNSY peaked at 47,000, making it the world's largest naval installation. While overhauling or converting 1,218 vessels, the shipyard launched nearly 50 new warships, including the battleship *Wisconsin*, the aircraft carrier *Antietam*, and the cruisers *Chicago* and *Los Angeles* (Binzen, 1997).

Although the shipyard continued to build ships during the Korean and Vietnam wars, PNSY began to phase out the new-construction business in the late 1960s, turning this work over to the private sector. The last ship built at the PNSY was the command ship USS *Blue Ridge* in 1970. (See Appendix A for a list of ships built at PNSY.) Along with other public shipyards, PNSY was assigned to ship repair

⁴In addition to building the first American warship, the first American fleet, the U.S. Navy, Marine Corps, and Navy Department were created in Philadelphia.

and overhaul work and specialized in fossil-fueled, sophisticated, surface combatants. Areas of expertise evolved to include high-pressure steam turbine engines, electronics, and combat systems. The Service Life Extension Program (SLEP), a multibillion-dollar rebuilding of five of the Navy's eight conventional aircraft carriers, accounted for half of the shipyard's workload during the 1980s. In addition, PNSY performed combat system upgrades on older cruisers and destroyers to make them more compatible with the Navy's newest Aegis-class cruisers (FAS, 2000).

SHIPYARD'S SIGNIFICANCE

As an Industrial Facility

In the 1980s, PNSY had several problems with the execution of its ship repair work. Increased workload in the early 1980s led to the expansion of the workforce at the shipyard. Although there were doubts that the shipyard could attract sufficient numbers of blue-collar workers to meet the expanding workload, the real problems arose with growth in the management and supervisory portion of the workforce. The leadership needed to plan, schedule, and execute repair projects was diluted, resulting in schedule slippage and uncompleted work.

In 1988, however, consultants were invited to the shipyard to teach new work planning and construction techniques. By 1992, the Navy reported that productivity for various shipyard functions had increased by 20 to 50 percent throughout the yard, making PNSY the leader among public shipyards in most measures of shipyard efficiency (Holcomb, 1995k, p. C01). Furthermore, although a federal facility, PNSY operated without federal subsidies and consistently completed work packages on time or ahead of schedule.

According to PSNY workers and managers, the key to the shipyard's turnaround in the late 1980s was the emphasis placed on innovation. Applying Japanese and American managerial techniques to the maritime industry, PNSY developed a unique framework for focusing on quality, interactive employee involvement, and constant process analysis and improvement that was dubbed the "Philadelphia Quality Process." In addition, PNSY became the first shipyard in the United States to utilize zone technology in ship repair. This meant

that the planning, design, execution, and monitoring of all ship repair work were performed “modularly” (by geographic zone rather than by systems) and by integrated work teams (National Maritime, 1993, p. 34).

As an Employer

At the time that the BRAC Commission recommended PNSY’s closure in September 1991, the shipyard employed 7,371 workers (U.S. Navy, NAVSEA, 1996, p. 5). However, the economic impact of PNSY operations extended far beyond these employees. According to a 1993 Coopers & Lybrand study for the Pennsylvania Economy League, the shipyard was directly and indirectly responsible for

- 36,400 total jobs,
- \$326.2 million in direct income, and
- \$113 million in annual state and local tax revenues.

Furthermore, PNSY was an anchor for the region’s industrial base, attracting many firms to the region, occasioning the start-up of others, and creating an extensive network of local suppliers. PNSY’s economic significance was heightened by the city’s high unemployment.⁵ In addition, PNSY’s labor force was largely composed of middle-income, blue-collar workers, almost half of whom were younger than 40. With the shipyard’s closing, many considered it unlikely that these workers would find comparable jobs and wages without a great deal of assistance (*Investing*, 1993, p. 9).

TIMELINE OF KEY EVENTS FOR THE PHILADELPHIA NAVAL SHIPYARD

To help set the stage for the remainder of the report, the following presents a timeline of key events in the closing and reuse of the shipyard:

⁵In 1993, Philadelphia’s unemployment rate stood at 9.5 percent versus 6.9 percent for the United States as a whole (Pennsylvania Labor Market Information Data System, <http://www.lmi.state.pa.us>, as cited in Comegys, 1999, p. 9).

Opening of the PNSY	1801
Last ship built at PNSY (USS <i>Blue Ridge</i>)	1970
Secretary of Defense recommends PNSY be considered for closing	January 26, 1990
Secretary of Defense recommends that PNSY be closed (1991 BRAC)	April 12, 1991
Senator Arlen Specter argues against closing PNSY before Supreme Court	March 2, 1994
Signing of Master Lease (Navy-PSDC)	November 1994
Meyer-Werft proposal	December 1994
Meyer-Werft negotiations collapse	September 1995
Metro Machine signs lease	1995
Completion of the <i>Kennedy</i> overhaul	September 13, 1995
Kvaerner approached by Pennsylvania	1996
Closing of PNSY	September 27, 1996
Kvaerner-Philadelphia Memorandum of Agreement	October 21, 1997
Kvaerner Master Agreement signed	December 16, 1997
Kvaerner lease commencement	April 1998
Start of demolition	July 1998
Start of facilities construction	August 4, 1998
Kvaerner and unions reach agreement	September 4, 1998
Kvaerner announces exit from shipbuilding	April 30, 1999
Amendment to Kvaerner Master Agreement	July 30, 1999
Start of first ship production	March 31, 2000
Transfer of PNSY ownership to PSDC	April 1, 2000
Completion of Kvaerner facilities	September 2000
Planned completion of first ship	March 2002.

BASE CLOSURE DECISIONS

BRAC PROCESS

Because of the public's concern about the effects of closures on communities and their economies—as well as questions about the impartiality of those making base closure decisions—closing unneeded military bases has been a difficult process. In fact, no major domestic military bases were closed between 1977 and 1988. However, as the defense budget and force size were beginning to decrease and future reductions were expected, Congress enacted special legislation in 1988 and 1990 that addressed many of these concerns and questions and allowed four rounds of BRAC decision-making to occur in 1988, 1991, 1993, and 1995.

The 1990 legislation called for an independent Defense Base Realignment and Closure Commission appointed by the President, in consultation with Congress. It also outlined a set of procedures and responsibilities for DoD, the commission, the President, and Congress. Henceforth, the Secretary of Defense would make recommendations for closing and realigning military bases relying on clearly articulated, published criteria used in selecting candidate bases; the review of his proposals by the commission; acceptance or rejection of the commission's recommendations in their entirety by the President; and final acceptance or rejection of the recommendations in their entirety by Congress.

According to DoD, the four rounds completed between 1988 and 1995 produced decisions to close 97 out of 495 major domestic mili-

tary installations and numerous smaller installations and to realign many others.¹

Navy Closures

Other than the closure of the Philadelphia Naval Base and Shipyard, the first two BRAC rounds had a small impact on the Navy as a whole. BRAC III and BRAC IV (in 1993 and 1995, respectively) resulted in the decision to close a significant number of naval installations, most of which were operationally closed by the end of 1998. Many of these bases, however, will remain in caretaker status until final conveyance, and, during this transitional period, the Navy will continue to bear most of the costs of ownership. As of July 2000, the Navy had spent approximately \$10.4 billion to close bases, including \$3.1 billion to realign functions, \$3.6 billion in environmental cleanup costs, and \$3.7 billion in physical closure and personnel costs. Of the 135 Navy bases that have been closed, 91 (about equally divided among small, medium, and large installations) have been determined to be surplus and require property transferal. By the end of 2000, 40 bases had yet to be transferred to a new owner or owners.² Table 3.1 is a listing of many of the major Navy/Marine Corps bases/installations that have been closed, or have been designated to close, as a result of recent BRAC decisions.

Philadelphia Closures

The downsizing of the military at the end of the Cold War, the duplication of shipyard functions by several installations on the East Coast,³ and PNSY's inability to perform nuclear overhauls on the Navy's aircraft carriers led to a series of decisions by the DoD BRAC that shut down most of the activities that had been performed at the

¹The number of bases recommended for closure or realignment in a given BRAC round is often difficult to tabulate precisely because closure decisions are not necessarily complete closures and closures vary in size (U.S. GAO, 1997, p. 17).

²Interview with NAVFAC officials Harry H. Zimmerman, Howard D. Kelsey, and Don Allen, July 19, 2000.

³These installations included the Portsmouth Naval Shipyard, the Norfolk Naval Shipyard, the Charleston Naval Shipyard, and the Philadelphia Naval Shipyard.

Table 3.1
Major Navy Closures from Recent Base Closure Rounds

1988	1991	1993	1995
Philadelphia	Hunter's Point	MCAS El Toro, Calif.	Naval Air Facility,
Naval Hos-	Annex, Calif.	Naval Hospital Oakland,	Adak, Alaska
pital, Pa.	MCAS Tustin,	Calif.	Long Beach
Naval Station	Calif.	NAS Cecil Field, Fla.	Naval Shipyard,
Galveston,	NAS Chase	NAS Agana, Guam	Calif.
Tex.	Field, Tex.	Naval Electronics Systems	Fleet Industrial
Naval Station	NAS Moffett	Eng. Center, St. Inigoes,	Supply Center,
Lake	Field, Calif.	Md.	Oakland, Calif.
Charles, La.	Naval Station	Naval Station Charleston,	Ship Repair
Naval Station	Long Beach,	S.C.	Facility, Guam
Brooklyn,	Calif.	Naval Station Mobile, Ala.	Naval Air War-
N.Y.	Naval Station	NAS Alameda, Calif.	fare Center,
	Philadelphia,	Naval Station Treasure	Aircraft Divi-
	Pa.	Island, Calif.	sion, Indianap-
	Philadelphia	Naval Aviation Depot	olis, Ind.
	Naval Ship-	Pensacola, Fla.	Naval Surface
	yard, Pa. ^a	NAS Barbers Point,	Warfare Center,
	Naval Elec-	Hawaii	Crane Division
	tronic Sys-	Naval Station Staten	Detachment,
	tems	Island, N.Y.	Louisville, Ky.
	Engineering	NAS Dallas, Tex.	Naval Surface
	Center, San	Mare Island Naval Ship-	Warfare Center,
	Diego, Calif.	yard, Calif.	Dahlgren Divi-
	Naval Station	Naval Aviation Depot	sion Detach-
	Puget Sound,	Alameda, Calif.	ment, White
	Wash.	Naval Training Center,	Oak, Md.
	Naval Con-	San Diego, Calif.	NAS South Wey-
	struction Bn	Naval Training Center	mouth, Mass.
	Center,	Orlando, Fla.	Naval Air War-
	Davisville,	NAS Glenview, Ill.	fare Center,
	R.I.	Charleston Naval Ship-	Aircraft Divi-
		yard, S.C.	sion, Warmin-
		Naval Aviation Depot	ster, Pa.
		Norfolk, Va.	
		Naval Air Warfare Center,	
		Trenton, N.J.	

SOURCE: U.S. GAO, 1997, pp. 57-58.

^aThe 1991 BRAC Commission recommended that PNSY be closed while "preserving the shipyard for emergent requirements." BRAC 1995 dropped the preservation requirement and led to the permanent closure of the shipyard.

NOTE: The table lists most of the major closures of the 135 Navy installations closed under the BRAC process. NAS = Naval Air Station. MCAS = Marine Corps Air Station.

Philadelphia Shipyard. In 1991, BRAC ruled that the Philadelphia Naval Shipyard was to cease operations following the complex overhaul of the USS *Forrestal*, which was scheduled for completion in September 1993. Under this decision, the Navy retained ownership of the shipyard, preserving access to its facilities in the event of a national emergency and continuing to carry out certain existing functions that would be prohibitively costly to relocate.

Navy facilities that were to remain at PNSY after closure included:

- NAVSSES, a field activity of the Naval Surface Warfare Center (NSWC), Carderock Division, is a research facility providing in-service engineering and test and evaluation services for ships' hulls and mechanical and electrical systems;
- The Propeller Shop and Foundry, which manufactures propellers for all types of vessels in the U.S. fleet; and
- The Naval Inactive Ship Maintenance Facility, which was responsible for the storage and maintenance of mothballed ships of the fleet.

The 1995 BRAC reversed the previous commission's "close and preserve" policy, which had resulted in the Navy's holding on to PNSY's large carrier docks and various structures and facilities on the assumption they might be needed in emergencies. With the continuing shrinkage of the Navy's force structure, it was decided that the Philadelphia facilities were no longer needed, and the shipyard property not required to support remaining Navy activities was declared excess. In addition, under BRAC 1995, the NSWC Carderock Division component at Annapolis, Maryland, was identified for realignment to NSWC Carderock Division, Philadelphia.

Finally, as part of the decision, the Navy decided to relocate the inactive ships that were berthed at the shipyard's Pier 6. This space was considered by the city to be desirable by prospective tenants of the yard, and the Navy agreed in 1998 to move the majority of the ships to Rhode Island and other locations (including the Reserve Basin at the Philadelphia complex).⁴

⁴Interview with NAVFAC official David Drozd and PIDC official, Bob Gorgone, July 26, 2000; and Comegys, 1999, p. 8.

OPPOSITION TO BASE CLOSURE

Philadelphia-area politicians, business representatives, and union leaders raised a number of arguments in opposition to the closure of the Philadelphia Naval Shipyard, hoping to overturn the decision of the 1991 BRAC.

Unclear/Unfair Selection Process

All the congressional leaders from Pennsylvania, New Jersey, and Delaware, along with the city of Philadelphia and the labor unions, rallied in an attempt to overturn the closure decision. Pennsylvania Sen. Arlen Specter and U.S. Rep. Robert E. Andrews of New Jersey questioned the clarity and fairness of the BRAC process that led to the PNSY's closing. On the floor of the Senate, Specter quoted a May 1991 General Accounting Office (GAO) report acknowledging the agency's inability to properly assess the Navy's recommendations for closure "due to the limited documentation" of the latter's selection process (U.S. GAO, 1991, p. 46). In addition, Specter discovered that the commission itself had expressed concern regarding certain subjective factors used in the Navy's decisionmaking process (U.S. Senate, 1991).

Congressman Andrews complained that the Navy had accorded the Long Beach Naval Shipyard special treatment in 1991. According to him, the Navy exempted six of the eight public shipyards from their closure review because they were nuclear-certified, leaving only PNSY and Long Beach. Then, in February 1991, the Chief of Naval Operations approved a request, in apparent violation of the Navy's own guidelines, to appropriate a million dollars for capital improvements to Drydock 1 at the Long Beach Shipyard, making that facility nuclear-capable (U.S. House, 1991).

Military Value Argument

In May 1991, Senator Specter gained access to several documents that supported his contention that the PNSY should remain open. One document argued that the closure of PNSY, without retention of the large carrier-capable docks, created a shortfall in drydock capa-

bility on the East Coast.⁵ Another Navy publication indicated that the utilization in naval shipyard drydocks was in excess of 70 percent—the limit that the Navy had established so as to maintain at least a 30 percent vacancy for emergencies (U.S. Senate, 1991).⁶ For his part, Congressman Andrews criticized the Navy's decision to exempt from closure analysis any shipyard that was nuclear-equipped, given that 70 percent of the U.S. fleet in 2000 would be conventionally powered (U.S. House, 1991). Other PNSY defenders contended that oil-fired carriers like the *USS Forrestal* and the *USS Kennedy* should be retained in fleet because they could be based at foreign ports, while foreign basing of nuclear ships was more limited.

Political Argument

Philadelphia union leaders thought that business interests were behind the PNSY closure. There were arguments that PNSY workers had simply been too good at their jobs. Seeing their numbers dwindle and their workload drop, private shipyards in the United States had lobbied Congress for more than their fair share of the contracts for new construction, overhauls, and upgrades on naval ships. Consequently, more and more work had been taken from the public yards and given to the private ones (Murphy, 1995, p. 30). Others accepted the idea that the Navy needed to reduce the number of its installations. Still, Pennsylvania had been required to accept more than its share of base closures. Pennsylvania, they argued, was the premier loser in terms of net civilian losses by state (31,453 versus 7,775 for second-place California). On the other hand, the southern states were net winners despite the fact unemployment was much higher in the north than in the south in 1992 (PNSY, 1992, p. 3).

Cost/Benefit Argument

Another group of PNSY stalwarts argued that the benefits of keeping PNSY open exceeded the costs of closing the shipyard. According to the Navy's own calculations, PNSY ranked first among the service's eight naval shipyards in efficiency and productivity throughout the

⁵See Exhibit 8, "Strategic and Operational Consequences," in U.S. Senate, 1991.

⁶See Exhibit 10, "Capacity Analysis."

1980s. Furthermore, it was the only shipyard, public or private, capable of performing the SLEP. If PNSY were closed, this group predicted, the Navy would be forced to hire an additional 6,000 workers at receiving bases, requiring millions in additional recruitment, training, and relocation costs (PNSY, 1992, p. 2). Indeed, the Navy and the commission had supposedly underestimated PNSY's closure costs. The commission reported that the cost to close the shipyard was \$102 million and that associated savings would produce a payback in two years.⁷ However, the shipyard's own estimated cost to close was between \$780 million and \$1 billion, the latter reflecting the inclusion of recurring costs, such as the shipyard's man-day rate, which was the lowest among the naval shipyards (PNSY, 1993, p. 2).

COURT CASE

Failing in their attempt to persuade the commission or the Bush Administration to retain the PNSY, closure opponents filed a lawsuit against the Navy in U.S. District Court, contending that the Navy and the commission had acted improperly throughout the base closure process, including hiding documents and silencing whistleblowers. Accordingly, they sought to enjoin the Secretary of Defense from carrying out the President's decision to close PNSY. Although the district court dismissed the complaint on the ground that the 1990 Act precluded judicial review, the U.S. Court of Appeals held that judicial review of the closure decision was available to ensure that the Secretary and the BRAC Commission had complied with the procedural mandates specified by Congress (U.S. Supreme Court, 1994).

On March 2, 1994, Senator Specter personally argued the case of *Dalton v. Specter* before the U.S. Supreme Court. In his presentation, he contended that the Defense Department had specifically violated the BRAC Act's requirements that all information relied on in the base closing process be made available to the commission, the GAO, and

⁷Both the city and the Navy put forth numerous cost estimates during the closure process. We provide many of these cost estimates in the chronology of the closing and reuse of the shipyard. Readers should be cautious of the fidelity of these various estimates. They were typically developed by different organizations using different assumptions and factors, and with different objectives.

Congress. Nevertheless, the Supreme Court chose not to address the issue of whether the commission had acted improperly in deciding to close the PNSY. Instead, the Court held that judicial review was not available for the shipyard's supporters. The actions of the Secretary and the commission were not reviewable "final agency action," since their reports could not directly result in base closings. Rather, it was the President who—by his approval of the recommendations of Congress—was directly responsible for base closure decisions, and the courts had no authority to review the President's actions in this case (U.S. Supreme Court, 1994; FAS, 2000, p. 2).

FINAL WORK AT THE PNSY

As a concession to PNSY supporters, the Navy agreed to allow the Philadelphia Shipyard to complete the overhaul and conversion of the USS *Forrestal*, which the Pentagon had previously proposed stopping in response to Administration budget cuts. In addition, Congress recommended that PNSY undertake a 24-month complex overhaul of the USS *Kennedy* beginning in September 1993. For insurance, provisions requiring the *Kennedy* complex overhaul to be accomplished at PNSY were included in the FY 1992 Defense Authorization and Appropriations bills (FAS, 2000, p. 2; *Investing*, 1993, p. 7). The *Kennedy's* \$491 million overhaul was one of the most difficult in the shipyard's history in that it required maintaining the skills and manpower necessary for a complex SLEP while simultaneously moving toward base closure. Nevertheless, with cooperation from organized labor, worker cross-training, and some assistance from other shipyards and outside contractors, PNSY completed the overhaul of the 80,000-ton carrier on September 13, 1995, two days ahead of schedule (U.S. Navy, NAVSEA, 1996, p. 13; Nozilo, 1995).

PHILADELPHIA'S REUSE PLAN

ORGANIZATION, PROCESS, AND RESPONSIBILITIES

Even while fighting a losing battle to keep the PNSY open, Philadelphia's civic leaders began to develop a mechanism for reuse planning in the expectation that the shipyard would close. Despite the complexity of the project, Philadelphia had one major advantage: unlike other installations that were declared as excess, the Philadelphia Naval Shipyard was entirely within one jurisdiction. On the other hand, city officials understood that reuse planning success depended on achieving a political consensus among all the interests in the region that would be affected by PNSY's closing, the better to present a united front in negotiations with the Navy (Lukefahr, 1995, pp. 44-45). To lead and coordinate the planning effort, Philadelphia Mayor Ed Rendell looked to two organizations: the Commission for Economic Development and the Office of Defense Conversion.

Commission for Economic Development

The Mayor's Commission for Economic Development at the Philadelphia Naval Complex¹ was appointed in 1992 to be the focal point for community, business, and individual participation in the conversion initiative. The commission has broad representation and is multijurisdictional. Its members include regional elected officials, business and labor leaders, Philadelphia Naval Complex personnel,

¹This commission, as well as the Philadelphia Office of Defense Conversion, addressed issues associated with the entire naval complex, not just the shipyard.

and residents of communities affected by the base closure. It serves as a forum to solicit community views on the planning process, to communicate to the community the progress of the planning process, to receive reports from technical advisory committees, and to assist in acquiring resources to implement the city's reuse strategy.

Several advisory committees were formed to assist the commission on specific issues. For example, the Technology and Business Development Advisory Committee supervised the analysis done by consultant Coopers & Lybrand on the potential for developing new markets for the industrial capacity and technology of the shipyard and its workers. Along with four consultant teams, the Land and Facilities Committee was charged with developing a reuse strategy and land development plan for the shipyard.

Office of Defense Conversion

The city created the Office of Defense Conversion (ODC) to coordinate all local efforts supporting the closure and reuse of the naval shipyard as well as other defense closures and realignments in Philadelphia. Initially part of the city's Commerce Department, it became a division of the Philadelphia Industrial Development Corporation (PIDC), a public-private economic development agency, in July 1995. In addition to facilitating the work of the commission and advisory committees, the ODC coordinates with various public and private agencies on the naval base project, including the PIDC, City Planning Commission, City Law Department, Private Industry Council (PIC), and Ben Franklin Technology Center (BFTC).² The ODC was primarily responsible for preparing the Community Reuse Plan for the naval complex that was submitted to the Navy for consideration in 1994 (PIDC, 1994, pp. 7–8; Philadelphia, 1993a, p. 9).

REUSE PRINCIPLES AND ALTERNATIVES

Although the mayor was determined to move quickly with reuse planning for the shipyard, the commission and the ODC faced two

²PIC is primarily responsible for employment services and retraining. BFTC supplies specialized input on the business and technology component of the strategy (PIDC, 1994, pp. 7–8).

basic obstacles. First, they had no reuse model to follow, because the Philadelphia Shipyard was the first shipyard to close under the Pentagon's facility reduction process. Second, the Navy's initial decision to retain ownership of the shipyard property largely limited the redevelopment options for this area to a shipyard, eliminating other possibilities, such as an amusement park, an Olympic stadium complex, or a regional mall.³ However, most other alternatives had little appeal to the city since "any quick fixes like theme parks or retail would provide only minimum-wage jobs" and would fail to "promote a strong industrial base" (Lukefahr, 1995, p. 45; Comegys, 1999, p. 5).

Two-Track Approach

To begin with, the city decided on a two-track approach to reuse planning. It would continue to pursue options that would keep most of the shipyard open and operating as a government-owned shipyard but participating in additional markets. In parallel, it would take other actions that might create additional high-quality jobs. The second approach would involve planning for the development of the nonshipyard part of the naval complex and working with the Navy on terms for the transfer of a part of the shipyard facility to the city. This two-pronged approach by city officials stemmed from recognition that not all the possibilities envisioned for the former shipyard, or the efforts to provide new employment for the workers, would succeed (Philadelphia, 1991; 1993, p. 1).

Goals

According to its 1993 Philadelphia Naval Base Conversion Initiative, the city had two basic goals for the workers then employed at the shipyard:

- Provide employment opportunities at the shipyard or its successor organization, at newly created or established firms at the shipyard, or with existing firms and organizations in the city and region.

³The city did not pursue the option of locating many of the other possibilities on the former naval station property.

- Provide training and counseling to permit workers to compete for continuing or newly created jobs at the base or elsewhere in the city or region.

Likewise, the Conversion Initiative mentioned two basic goals for the city:

- Preserve the level of employment and economic activity currently generated at the shipyard by preserving the industrial capacity of the yard, by converting it to civilian activities, and by supporting the creation of new jobs and economic activity.
- Develop the excess land and facilities of the yard to further the city's and the region's goals of job creation and revenue generation (Philadelphia, 1993, p. 7).

Three-Part Strategy

To implement the city's goals, the Conversion Initiative outlined a three-part conversion strategy:

- *A strategy for training and job placement* was designed to provide assistance in counseling, training, and placement to the workers employed at the shipyard.
- *An economic development strategy for the development of excess land and facilities at the naval base* involved initiating a comprehensive planning process for the nonshipyard portion of the naval complex under the direction of the Land and Facilities Committee.
- *An economic development strategy for the retained shipyard* included supporting Navy activities that would remain at the shipyard—for example, the Naval Surface Warfare Center—and identifying a way to continue to use shipyard facilities for their original purpose of building and repairing ships.

With regard to the latter strategy, one proposed scenario was to develop a private shipyard at the former naval shipyard. Another option was to create a National Maritime Industrial Center at the PNSY. This idea stemmed from the National Shipbuilding Initiative advanced by the Defense Department's Defense Advanced Research

Projects Agency (DARPA), an initiative designed to revitalize the U.S. maritime industry and break the reliance of domestic shipbuilders on the Navy. Unlike DARPA's proposal, the Philadelphia Maritime Center was intended to be more than a research and development facility. According to the Conversion Initiative, it was to be co-located with an operational shipyard, facilitating the transfer of new technology from the laboratory floor to the shop floor (Philadelphia, 1993, pp. 10–13).

REUSE PLAN FOR NAVAL COMPLEX

Building upon the city's initial reuse strategy, a more detailed Community Reuse Plan was prepared by the ODC⁴ and presented to the Mayor's Commission on Defense Conversion in September 1994. This plan maintained the general organization of the former naval complex by subdividing the property into five major land uses: a private shipyard, a mixed-use urban center, an industrial park, a distribution center, and a housing complex. See Figure 4.1 for a map of the redevelopment zones proposed by city planners.

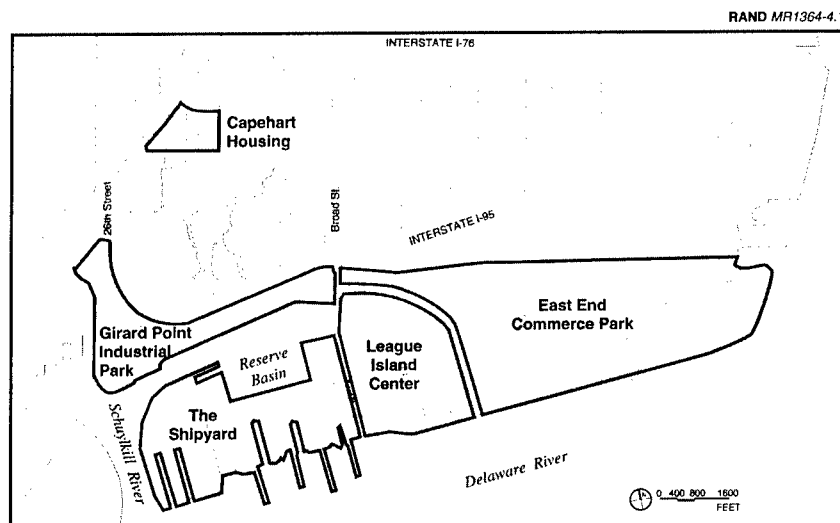
Shipyard

With limited opportunity for major physical changes in the shipyard area west of Broad Street, the plan proposed replacing Navy activities, wherever possible, with private industrial functions that required the type of buildings, equipment, and special waterfront facilities already available.

League Island Center

In the area immediately east of Broad Street, the city sought to establish a mixed complex of administrative, institutional, research, light industrial, and commercial functions that would exploit the site's historic urban quality.

⁴ODC consultants working on the Community Reuse Plan included Kohn Pedersen Fox Associates (architectural planning), Coopers & Lybrand (economic development), Roy F. Weston, Inc. (environmental engineering), and Urban Engineers (utilities engineering) (PIDC, 1994).



SOURCE: PIDC, 1994, p. 4.

Figure 4.1—Proposed Redevelopment Zones at the Former Philadelphia Naval Complex

Girard Point Industrial Park

The plan proposed an industrial park, composed of large warehousing and distribution facilities, for Girard Point in keeping with the area's geographic isolation and limited number of reusable structures.

East End Commerce Park

The city planned to establish a distribution center in the largely undeveloped section of the naval base (formerly occupied by the Mustin airfield) that would take advantage of the area's easy access to highway, rail, and port facilities.

Capehart Housing

Finally, it was proposed that the Capehart Community housing complex remain in residential use, with renovation and upgrade of

the existing units, but no significant change to the architectural character or scale of the existing development.

IMPLEMENTATION ISSUES

Philadelphia's 1993 Conversion Initiative and 1994 Community Reuse Plan both recognized that to ready the former naval shipyard for private development, several issues had to be addressed, some which were not entirely under the city's control. These included obtaining sufficient financing for job training and economic development projects, working out a mutually satisfactory environmental cleanup plan with the Navy, concluding an agreement with the Navy for the interim and long-term utilization of excess naval property, and establishing a mechanism for sharing utilities functions and costs between remaining Navy elements and new civilian tenants.

Financing

Philadelphia's strategy for financing the reuse initiative was aggressive and consisted of several approaches:

- Pursue all federal funding opportunities in areas of defense conversion, technology and research, job training and education, infrastructure, and economic development.
- Seek state and regional funds.
- Attract private investment capital.
- Obtain Navy agreement to make available at nominal cost the land and facilities it has no immediate need for but intends to retain; and to provide—again at a nominal cost—the land and facilities it intends to excess (Philadelphia, 1993, p. 29).

The 1994 Community Reuse Plan described two funds—the Economic Conversion Fund (ECF) and the PIDC Defense Conversion Fund—that had been established in 1993 to provide direct financial assistance. The ECF was a special \$50 million Defense Department appropriation intended to simulate private investment activity in three areas: resources to enable workers to develop new skills and benefit from entrepreneurial opportunities; investment in physical

assets; and capital for businesses and technology initiatives.⁵ The PIDC Defense Conversion Fund was created by Philadelphia to assist local defense contractors hurt by defense cutbacks as well as to support firms that were involved in commercialization of defense technologies, that hired former defense sector workers, or that were established as start-ups by former employees of closed military installations.⁶

Environment

According to the Community Reuse Plan, the environmental clean-up requirements of the shipyard, while significant, did not pose insurmountable problems. The key issue with respect to industrial contaminations of the property was not whether they could be adequately handled, but rather revolved around the amount of time and money required to complete corrective actions. Initial budget estimates indicated a cost of more than \$100 million for environmental restoration and compliance actions through 1996, with a projected funding shortfall of approximately \$44 million.⁷

Property Ownership

Philadelphia officials complained that there would be limited opportunity to restructure the shipyard—and thereby attract private companies—so long as the Navy retained ownership of the facility. According to the 1991 BRAC decision, the Navy would continue to occupy various buildings; demolition would be restricted to structures that the Navy determined were either unsafe or unsalvageable; leased buildings could not be significantly modified or converted to

⁵A large portion of this DoD money was administered by other federal government agencies, i.e., the Office of Economic Adjustment, the Economic Development Administration, and the Department of Labor. See U.S. GAO, 1994, p. 28.

⁶The PIDC Defense Conversion Fund was initially capitalized with \$1.6 million in Economic Defense Authority Title IX funds, matched by \$750,000 from the city of Philadelphia and the PIDC (PIDC, 1994, p. 64).

⁷The estimate of \$100 million for environmental restoration applied to the naval complex. No separate estimates were provided for just the shipyard (PIDC, 1994, p. 18). As a point of reference, NAVFAC reported actual environment-related costs associated with the shipyard of approximately \$75 million (see Table 5.5).

dissimilar new functions; and new construction would be restricted to temporary or low-cost structures necessary to support an activity in one of the leased buildings. Furthermore, the Navy would continue to use the piers and entire frontage of the Reserve Basin for mooring inactive ships, inhibiting the city's plans to attract private maritime users to the shipyard.

Short of full-scale transfer of the shipyard property, the city sought approval of a master lease for the industrial space the Navy would not be using after 1995, thus permitting individual buildings to be subleased to private tenants. Once in place, the lease would allow the city to act on reuse applications for already vacant buildings and to market the remaining facilities as soon as they became available (PIDC, 1994, p. 70; Hankowsky, 1995, p. 96).

Utilities

According to the Reuse Plan, the utility infrastructure of the Philadelphia Naval Complex was the largest, most complex non-municipal system in the region. Finding a mechanism for separating utilities serving Navy property from the remainder of the system was proving to be a monumental task. On the one hand, Navy consultants had prepared a conceptual plan for the separation, whose primary objective was to provide the Navy with an independent utilities system that met the service's needs in the shipyard after closure. According to the city, implementation of this plan would have adversely affected the utilities systems of the excess area outside the shipyard. On the other hand, the city's plan looked at the problem from the perspective of the excess area's utilities systems and sought primarily to support the requirements of economic redevelopment in the shipyard (PIDC, 1994, p. 40).

**THE NAVY'S CLOSING POLICIES,
PRACTICES, AND COSTS**

CLOSURE RESPONSIBILITIES AND PROCEDURES

The closure of the Philadelphia Naval Shipyard was a complex process that involved a number of Navy commands and civilian agencies. The Naval Sea Systems Command (NAVSEA) and the Atlantic Fleet had the responsibility for the closure of the shipyard. The PNSY's last commander, Captain John C. Bergner, who integrated NAVSEA's BRAC office into his existing executive support staff, initiated the process. Captain Bergner's responsibilities included closing down and turning over PNSY facilities as well as disposing of personal property, excess material, and historical artifacts. The other major Navy player in the closure process was the Naval Facilities Engineering Command (NAVFAC). NAVFAC's Northern Division had responsibility for the supervision of installation restoration sites (e.g., landfills) and the handover of buildings to regional authorities for reuse. It also established a Caretaker Site Office (CSO) at the naval base, which assumed temporary responsibility for the management of vacant Navy properties after closure.¹

¹According to Navy regulations, following the operational closure of a base, the NAVFAC Engineering Field Division (EFD) assumes ownership and managerial control of the facility in accordance with a Transfer Agreement negotiated with the former base commander. In addition to delineating local responsibilities and actions, this agreement supports projected caretaker budgets and justifies the staffing of the NAVFAC CSO that will directly manage the closed facility and provide official interface with DoD, the local redevelopment authority (LRA), the local community, and remaining tenants.

As the Local Redevelopment Authority (LRA), the Philadelphia Authority for Industrial Development (PAID) designated PIDC as the Navy's main regional partner in base closure and reuse. For its part, PIDC contracted with Cushman and Wakefield, the nation's largest independent property management firm, to manage the realty assets at the naval complex not retained by the Navy, including caretaker services—as designated in the Cooperative Agreement between the Navy and the city—and lease management services.

Initial Closure Procedures

According to the Navy's base conversion procedures, the base closure process starts with the active commands at the base accomplishing the steps necessary to close the facility, including relocating personnel and equipment, mothballing equipment and facilities, and performing basic cleanup. A January 1994 memo by the Navy Chief of Naval Operations (CNO) establishes six maintenance levels to describe the extent of layaway and caretaker maintenance to be provided for facilities that do not remain in continuous use. The selection of specific maintenance levels depends on the potential or planned reuse of facilities (U.S. Navy, 1994, p. 1-3). In general, facilities with high reuse potential require a higher level of maintenance than those with low reuse potential. (See Table 5.1 for maintenance level definitions.)²

PNSY Closes Down

In Philadelphia, the closure tasks undertaken by the last PNSY commander were complicated by a number of factors. The complex overhaul of the USS *Kennedy* and the reduction in the shipyard workforce created a dearth of employees available for closure work, despite cross training. Another closure complication involved the

²The selection of an appropriate initial maintenance level for each closing facility is made by the base commander at the closing base in consultation with the LRA (if present) no later than 12 months prior to operational closure. The Navy's overall layaway goal is to limit maintenance of real property expenditures to the minimum necessary to limit facility deterioration and preserve the potential for long-term facility reuse (U.S. Navy, 1994, p. 2-1).

Table 5.1
Maintenance Level Definitions

Level I	IMMEDIATE REUSE: Facilities, systems, and equipment shall be initially maintained at fully operational levels. All services including utilities, mechanical systems, grounds maintenance, snow removal, and interior and exterior structural finishes will be continued until actual turnover.
Level II	REUSE WITHIN SIX MONTHS OF OPERATIONAL CLOSURE: Heat and air conditioning remain operational. Maintenance and repair is continued in order to maintain the structural integrity, weather tightness, and utilities of the facility. Fire protection and detection systems are maintained. Limited grounds maintenance is continued.
Level III	REUSE WITHIN SIX MONTHS TO TWO YEARS: Same as Level II except no heat is provided in southern tier locations and no air conditioning is provided in northern tier locations unless required for humidity control.
Level IV	REUSE NOT IDENTIFIED: Same as Level II except that no heat or air conditioning will be provided. Water lines are drained and sewer traps are capped. Fire protection systems may be disconnected. All utilities are turned off.
Level V	LEASED: All utilities will be provided to the facility on a fee basis. No other maintenance, repair, or services will be provided to the facilities designated at this level.
Level VI	NO REUSE LIKELY: Facilities, systems, and equipment are abandoned in place and permanently closed. Windows and entrances are secured. Unauthorized personnel and visitors are prevented from entering the facilities and grounds immediately adjacent. Only conditions adversely affecting public health, the environment, and safety will be corrected. All utilities are disconnected and properly terminated.

transitioning of shipyard functions and tenant commands. Unlike the situation at other shipyards, the Navy intended to retain certain organizations and functions at the Philadelphia Shipyard site. Of the 171 PNSY facilities to be turned over, 52 were scheduled to remain open for Navy use after operational closure of the base. These facilities housed such Navy activities as the NSWC and its test facilities, plus engineering and administrative functions. This included the relocation of the Annapolis operations of NSWC and transitioning their test capabilities to Philadelphia. The Navy consolidated its foundry operations in Philadelphia and enhanced the capabilities of its amalgamated foundry and propeller manufacturing center. The Navy Inactive Ship Fleet Maintenance operation and Public Works Center were also retained.

Nevertheless, the process of shutting down the Philadelphia Shipyard appears to have gone relatively smoothly. To obtain the mix of manpower and skills needed for closure, PNSY solicited assistance from other naval shipyards and hired outside contractors. Following Zone Technology methods, PNSY broke down the closure process into projects that corresponded to buildings, piers, and drydocks, each of which was assigned to a project superintendent. In addition, the shipyard developed a schedule for facility turnovers to minimize personnel movement as administrative functions were consolidated (U.S. Navy, NAVSEA, 1996, pp. 15–16).

In achieving its goal of reducing the shipyard workforce to zero by fall 1996, Captain Bergner and his team followed a conscious policy of “putting people first.” To counteract the inevitable swirl of rumors, management utilized the shipyard newspaper, outside media, and communication networks within each shop to distribute accurate information on the downsizing and closure. In addition, PNSY formed an alliance with county, state, and municipal governments to ease the transition of shipyard employees toward new jobs or retirement. Human Resources Transition Team members petitioned and obtained federal government authority to start using \$28 million in Job Training Partnership Act (JTPA) funds two years before the base’s Mission Cessation date rather than two years before the Operational Closure date. Furthermore, they received expanded use of the DoD Separation Incentive Program (SIP)—which allowed workers to retain their SIP status and remain at the shipyard until the final reduction in force—and established a Priority Placement Program (PPP) to refer displaced employees for priority consideration for DoD vacancies. Finally, to promote a more sympathetic environment for PNSY workers, the Transition Team chose to train and use shipyard personnel as peer counselors at a newly established Career Transition Center instead of contracting out for counseling services (U.S. Navy, NAVSEA, 1996, pp. 8–12).

Closure Timeline

In 1991, the Navy estimated that it would take approximately three years to effect its closure plans at the Philadelphia Naval Shipyard, including relocation of functions off the base and consolidation of remaining activities, realignment of utilities, installation of new

security and maintenance provisions, and preparation of buildings and land for transfer of title. According to the Navy's plan, the bulk of excess property at the base would be ready for transfer by fall 1996, with the exception of a few environmentally problematic areas, whose cleanup was anticipated to extend into 2000 ((PIDC, 1994, p. 18). The following presents the Navy's closure steps and associated timeline (U.S. Navy, 1991):

- Establish and staff closure organization (first half of FY 1992).
- Revalidate requirement for retention of Navy propeller facility (by early FY 1993).
- Preserve/secure facilities and plant equipment (FY 1992–FY 1996).
- Environmental cleanup and NEPA efforts (FY 1992–FY 1996).
- Interface with community (FY 1992–FY 1996).
- Downsize military and civilian personnel (second quarter of FY 1993–FY 1996).
- Execute Class 2 property disposal (FY 1994–FY 1996).
- Cease mission operations (third quarter of FY 1994–FY 1995).
- Transfer utility plant operation to NAVSSES (third quarter of FY 1994–FY 1995).
- Transfer Propeller Shop and caretaker functions to Norfolk Naval Shipyard (third quarter of FY 1994–FY 1995).
- Relocate unique functions and capabilities to Norfolk Naval Shipyard (FY 1995).
- Consolidate residual personnel (FY 1996).
- Cease all operations (FY 1996).

NAVFAC TAKES OVER

Philadelphia was a particularly difficult BRAC for NAVFAC. On one hand, PIDC bargained hard with NAVFAC to minimize its costs and responsibilities before agreeing to assume control of the property on the former naval base. On the other, PIDC officials complained that

the entire process was unnecessarily slow and inefficient. Beyond these concerns, Navy and city officials confronted specific BRAC implementation issues concerning the leasing and transfer of base property, environmental remediation, utilities management, and police, security, fire, and maintenance responsibilities.

TRANSFER AND LEASING

Policy

In undertaking its base conversion duties, the Navy is bound by government guidelines concerning the disposal of excess federal property that specifies a mandatory process of preferential solicitations, or screenings, through which the property is offered to various government and public service entities in a fixed order of priority. The process includes five screenings:

- Within DoD,
- Other federal agencies,
- Homeless providers,
- State and local governments, and
- Private sale.

In the case of state and local governments, the Navy begins to prepare an environmental impact statement to evaluate property disposal alternatives as soon as it receives the Community Reuse Plan. Generally, this process takes about 12 months to complete. Based on its conclusions, the Navy issues a Record of Decision, which is the formal statement of the disposition decision (PIDC, 1994, pp. 11–12). Assuming the Navy has decided to offer property to the local community, the latter can apply for an economic development conveyance (EDC), which since 1993 has permitted the transfer of a wide range of proposed services and assets at as low as no cost to the recipient (U.S. Navy, unpublished briefing, undated).³

³The “Pryor” amendment authorized EDCs, but waiver of fair market value was left to the discretion of the Service Secretariat. In 1999, EDC authority was legislatively amended to allow no-cost EDCs.

Because excess property will not always be available for immediate transfer because of environmental cleanup requirements, the LRA usually has the option of leasing the property during the period between the Navy's initial disposition decision and the actual transfer of property to the community.⁴ This permits the LRA to enter into sublease agreements with companies that will actually occupy the property made excess, thereby facilitating local redevelopment efforts and minimizing Navy caretaker expenses. Leases can be executed for fair market value, for less than fair market value, for varying periods of time, and for different uses. Generally, "protection and maintenance" of the leased facility becomes the responsibility of the lessee. In addition, the Navy routinely collects revenue for Common Area Maintenance (CAM) charges and collects payment for utilities consumed by lessees.⁵

Types of leases commonly used by the Navy include the following:

- **Interim Leases of Five Years or Less.** These have been the typical BRAC leases. Protection and maintenance charges or fair market value rents are assessed. CAM and utility charges are standard. The leases do not give the LRA any claim for future reuse decisions. The LRA becomes responsible for the facility.
- **Interim Leases Longer Than Five Years.** These leases are basically the same as those for less than five years with one key exception. If the property is offered to the LRA, the latter has 180 days to accept the conveyance. Otherwise, the lease can be terminated along with any sublease.
- **Lease in Furtherance of Conveyance.** These leases are used when a conveyance is set, but conveyance cannot occur before regulatory (usually environmental) conditions are met. The LRA has control of the property; however, property use must be consistent with the reuse plan. A termination clause is included in these leases in the event the LRA does not accept conveyance once the regulatory conditions have been met.

⁴The regional NAVFAC EFD is responsible for developing and negotiating lease documents with the LRA.

⁵As the caretaker budget ramps down, CAM charges, passed on to sublessees, become more important to funding installation maintenance, operations, and repairs. Interview with NAVFAC officials, July 19, 2000.

- **Master or Zone Interim Leases.** These leases are used for larger areas on an installation where the potential for several subleases exists. Under their terms, a sublease can be executed by the EFD-warranted real estate officer and treated as a modification to the overall lease. These types of leases can be for any justifiable term. Although they offer considerable flexibility to the LRA, these leases require extensive preplanning and environmental work to get approved (U.S. Navy, 1997, pp. 32–33).

Implementation

In the case of Philadelphia, a master lease on the former Philadelphia Naval Station property was signed in November 1994. Called a “model lease” by Navy officials, the agreement permitted the city to sublease space at excess portions of the former naval shipyard to prospective tenants (Hankowsky, 1995, p. 96). Although the title transfer process dragged on longer than expected, negotiations between Philadelphia area officials and the Navy intensified following the closure of a deal with the Norwegian shipbuilder, Kvaerner ASA, to lease the shipyard property. Under the December 1997 Master Agreement, Kvaerner could postpone, or even forgo, certain financial obligations if the Philadelphia Shipyard Corporation failed to obtain full title to the shipyard by April 1, 2000, two years from the signing of the lease commencement date. Consequently, the PIDC submitted an EDC application in December 1998 that called for the Navy to transfer the shipyard for free in return for \$2 million for the nonshipyard portion of the former Navy base (PIDC, 1998).

In support of its “offer” for the shipyard, the Philadelphia team made the following points:

- The majority of buildings at the yard were old and obsolete for the proposed uses.
- Net of federal investments, the state and the city have invested approximately \$242 million to attract Kvaerner to the PNSY site.
- The industrial real estate market within the city continued to lag behind the improved suburban industrial market.
- Its cash flow model showed that the shipyard had a negative present value of approximately \$7.9 million (PIDC, 1998).

Not surprisingly, the Navy had a different opinion of the shipyard's worth. Its own independent appraisal of the PNSY, conducted by Insignia/ESG Jackson Cross Real Estate of Philadelphia, concluded that the property had an estimated fair market value of \$56.6 million, based primarily on revenues that would be generated by leasing the extensive waterfront industrial facilities (e.g., the two large drydocks) in accordance with PIDC's Reuse Plan. By contrast, the naval station property was valued at a net negative value of \$36.8 million, because of the expected negative cash flows associated with leasing its aging infrastructure in a depressed market and the city's planned land use for redevelopment. When considered together, the negative financial position of the naval station seemed to only partially offset the positive appraised value of the naval shipyard, leaving a combined positive value of \$19.8 million, not including the \$8 million that the Navy had expended in caretaker costs since the base's closing (U.S. Navy, 1999, pp. 8–9).

In the end, however, promotion of economic development for the city trumped the potential to receive revenue from the transaction, and the Navy proposed that the Defense Department use the EDC discounting authority to discount the positive property value of the Philadelphia Naval Base from \$19.8 million to zero to support economic development (U.S. Navy, 1999, p. 12; U.S. DoD, 1999). Accordingly, a property transfer agreement was reached late on March 31, 1999, just hours before the April 1 deadline demanded by Kvaerner (Walsh, 1999). As a result, the Navy accepted a \$2 million payment for the property with a share of the proceeds if the city were to sell the property within 28 years (with a maximum share of approximately \$30 million). When the city complained about sharing proceeds given that it planned to put a lot of money into renovating the yard, the Navy agreed to exempt revenues from sales if they were reinvested in the property. In 1999, Congress passed legislation authorizing no-cost EDCs and conversion of prior EDCs if certain conditions were met. The city applied for such a conversion, and the Navy approved the deal subject to a minimum payment of \$4 million for Morale and Welfare facilities as required by statute.

City ownership of the base property both streamlined planning processes and created opportunities to obtain financing for new businesses and improvements to buildings. Following the official transfer of title in April 2000, PIDC could sell as well as lease property on

the base; demolish buildings to make way for new structures or parking; and respond more rapidly to prospective tenants' plans for adapting base installations (Holcomb, 2000e).

ENVIRONMENTAL CLEANUP

Policy

Although BRAC statutes forbid taking environmental costs into consideration in closure decisions, environmental compliance and cleanup are necessary for the transfer of excess base facilities. The 1969 National Environmental Policy Act (NEPA) lays out Community Reuse Plan guidelines on water, noise, traffic, etc., and ensures that the environmental impact of proposed actions is carefully evaluated before implementation occurs. In addition, the Comprehensive Environmental Response, Compensation, and Liability Act and the Environmental Protection Agency's (EPA's) National Contingency Plan (NCP) require the government to disclose the environmental condition of any property it plans to dispose of and clean up the property to support conveyance.⁶ At closed Navy facilities, NAVFAC is responsible for the BRAC environmental program, which is normally staffed and funded separately from caretaker functions. The CSO is responsible, however, for compliance with all federal, state, and local laws and regulations that pertain to operating facilities or providing services at the closure site (U.S. Navy, 1997, pp. 14 and 25).

Implementation

NAVFAC's environmental remediation efforts proceeded rather smoothly on the whole. Indeed, the Navy scaled back its initial cleanup plans after a thorough review of the 1,000-acre site in fall 1996. Concurring with the Navy's decision, the Pennsylvania Department of Environmental Protection indicated that the reduced scope reflected essentially good news about the condition of the shipyard and was not an indication that the Navy planned to skimp

⁶This act, however, was amended in 1997 to allow the transfer of federal property before it was environmentally clean as long as the state governor and/or the regional EPA agree. Interview with NAVFAC officials, July 19, 2000; and U.S. Navy, unpublished, undated.

on its cleanup work (Webber, 1996). For his part, the EPA's regional administrator indicated in 1998 that, despite the identification of numerous contaminated sites in the shipyard over the years, many had been cleaned up, and others had been found not to be as serious as originally thought (Smith, 1998).

This does not mean that the Navy's remediation program was free from criticism by local authorities impatient to expand their redevelopment activities. For example, in 1998, the PIDC complained that the cleanup effort was hindering its plans to construct a \$7.5 million road inside the new Naval Business Center (Walsh, 1998). Nevertheless, in summer 2000, after having spent approximately \$75 million, NAVFAC declared its environmental cleanup of the shipyard and naval station virtually complete, with the exception of one three-acre site on Girard Point. The agency acknowledged that the overall complex still contained a certain level of lead and asbestos contamination. According to NAVFAC officials, buildings had been properly cleaned and placed in a layaway status with any remaining contaminants identified. The Navy was not legally obliged to remove them unless obvious problems existed (e.g., lead paint chips or exposed and flaking asbestos) and a facility became unsafe.⁷

The environmental remediation of the shipyard property was greatly facilitated by the "fast-track cleanup" procedures. These procedures, one of then President Clinton's five points for enhancing the reuse potential by the surrounding community and region, allowed environmental cleanup to the level appropriate for the subsequent use of the facilities and property.

UTILITIES

Policy

After base closure, the Navy's policy is to provide the minimum level of utility services necessary to support caretaker requirements and the BRAC Cleanup Plan. To the extent possible, utilities (including water, electricity, natural gas, and telecommunications services)

⁷Abatement of lead-based paint and asbestos is determined by DoD guidance. See U.S. DoD, 2001.

should be purchased from local providers, and government systems should be terminated. However, the Navy will maintain and provide utilities on a reimbursable basis for a year or more, depending on the extent of LRA participation in the transfer or sale of utilities. Navy officials in coordination with the LRA should spell out requirements for the reconfiguration and future management of utility systems in the Transfer Agreement (U.S. Navy, 1997, p. 18; 1996).

Implementation

Unfortunately, the utilities situation at the Philadelphia Naval Complex precluded a straightforward application of Navy policy. As previously noted, BRAC 1991 closed the shipyard and the naval station but retained the shipyard waterfront in a ready reserve status. At that time, planning began to separate what would be the Navy utilities from the newly excess (non-Navy) utilities. The Navy's concept was to create two independent utility systems. In this configuration, utility segregation was relatively simple; the complex was essentially divided in half, with the Navy retaining the property west of Broad Street and making excess the property east of Broad Street. Accordingly, three BRAC construction projects were funded, including one for \$13 million to address the utility requirements of the excess property that would be conveyed to the LRA.

By closing the shipyard completely and retaining only a handful of active Navy facilities on the base, BRAC 1995 greatly complicated the effort to segregate base utilities. The Navy-retained footprint became six noncontiguous islands instead of a neat half of the former complex. To make additional changes in the utilities configuration for the Navy's retained and excess parcels, two more BRAC Construction projects were submitted; however, these funding requests were denied, forcing modifications to the original three BRAC Construction projects, which were already facing resource constraints. This forced cutbacks in the scope of the construction that ultimately would have resulted in small "orphaned" portions (areas and facilities without some utility service) of the shipyard.

In addition to the distribution problem, the Navy began to develop a plan to cooperate with the city in purchasing utilities services to help the city obtain better rates from outside providers, thereby helping to attract private companies to the former naval base. Accordingly,

NAVFAC and the city signed an agreement on March 31, 1999, establishing a process whereby the city will take over ownership and managerial responsibility for all utilities systems at the base, including those owned by the Navy, and negotiate with private providers for services. If the price is right, the Navy will convey its utility systems to the city and pay it for the cost of utility services, including maintenance of the distribution systems on Navy-owned property. If a reasonable price cannot be agreed on in a year's time (spring 2001), the Navy will not convey utilities to the city but negotiate with utility providers to privatize the system on its own behalf. If privatization is unsuccessful, the Navy will resort to operating its utility systems in a "stand-alone" fashion. No plan exists, however, to operate the utility systems through the Public Works Center that currently serves both Navy and non-Navy customers at the shipyard.⁸

POLICE, FIRE, SECURITY, AND MAINTENANCE

Policy

During the BRAC transition period, police, fire, security (guards), and maintenance services are considered common expenses. NAVFAC negotiates with the community to determine the appropriate level of these types of services and pays a substantial portion of their costs until the property is transferred to the community.⁹ In addition, NAVFAC establishes CSOs to manage nonleased facilities and provide oversight of leased property. These offices, however, are minimally staffed and charged with maintaining facility property at a minimum level for a limited period of time. The Navy funds base caretaker services provided by private contractors or communities, cooperative agreements with LRAs, and/or support agreements with other military bases. At sites where there is active reuse, local communities are expected to assume more of the burden for common expenses, such as physical security (U.S. Navy, 1997, pp. 9–10).

⁸Interviews with NAVFAC and PIDC officials on July 19 and 26, 2000, and September 8, 2000; and Walsh, 1999.

⁹The Navy's financial obligation declines over time, normally a three-year period. The schedule can be a linear process, although usually it is a step process; as the Navy's share of common costs decreases, the communities' share increases. Interview with NAVFAC official, July 19, 2000; and U.S. Navy, 1997, p. 11.

In 1994, Congress passed legislation giving the Secretary of Defense legal authority to contract with local governments for police and fire protection and other community services at base closure sites. The standard to be used by NAVFAC is whether a private contract is necessary to facilitate the smooth transition of the facility from a military installation to a vital, contributing area of the local community. According to NAVFAC policy, compensation may be paid to the LRA for police and fire services until the expiration of the BRAC account or the date when the Navy determines that tax and license revenues generated from leased property are sufficient to cover the cost of such services (U.S. Navy, 1995). A key issue for police and fire services is legal jurisdiction, which may vary from location to location within a base and require adjustments over time to simplify law enforcement arrangements.¹⁰

Implementation

Prior to base closure, the Navy provided police, security, and fire protection services at the Philadelphia Naval Shipyard and Naval Station. Following the closure of the base in 1996, the city gradually assumed some physical security responsibilities. The Navy, however, continues to retain a small fire-fighting capability to support its own facilities, and there is a reciprocal agreement between the city and the Navy to help each other in fighting fires. (All tenants are expected to reimburse the Navy for fire-fighting expenses incurred on their behalf.) In addition, the Navy takes care of its internal police matters. PIDC provides security guards at the shipyard's front gate, and Philadelphia police conduct roving patrols and handle all calls from yard tenants. Tenants are responsible for security at their own facilities (e.g., the guards at the Kvaerner Shipyard gates).

¹⁰The Navy recognizes four categories of legal jurisdiction: exclusive jurisdiction, partial jurisdiction, concurrent jurisdiction, and proprietary jurisdiction. *Exclusive jurisdiction* implies that all police and criminal investigative services are provided by federal authorities; local governments are not authorized to provide police powers or fire protection services other than under existing mutual support agreements. Under *partial jurisdiction* the local government retains all legislative and judicial authority not ceded to the federal government. *Concurrent jurisdiction* permits both federal and local agencies to enforce both federal and local laws and statutes. Under *proprietary jurisdiction*, the local government is the principal police and fire authority (U.S. Navy, 1997, pp. 13–14).

Since the base closure, a private contractor, Cushman and Wakefield, has provided some real property maintenance at the former naval station in accordance with a Cooperative Agreement between the Navy and the PIDC. In the absence of a cooperative agreement covering the shipyard, the NAVFAC CSO,¹¹ assisted by the Public Works Center Detachment, was responsible for maintaining property there from 1996 until 2000. Following the transfer of the naval complex to PAID in March 2000, NAVFAC's obligations at the former naval base came to an end, with the exception of the lingering utilities responsibilities mentioned above.

COSTS TO THE NAVY OF CLOSING THE SHIPYARD¹²

The costs to the Navy of closing the shipyard and managing the transition to the regional authority were incurred by two organizations, NAVSEA and NAVFAC. The costs incurred by NAVSEA are shown in Table 5.2.

The majority of the costs to NAVSEA were associated with the civilian personnel employed at the shipyard. In September 1991, the ship-

Table 5.2

NAVSEA Costs of Closing the PNSY
(thousands of dollars)

Cost Element	Costs
Civilian Personnel	107,472
Equipment	7,693
Facilities	25,210
Unique Functions	32,351
Tenants (nonlabor)	10,602
Postclosure Residual Functions	5,441
Other Costs	13,781
Environmental Compliance	1,395
Total (FY 1994 to FY 1999)	203,945

¹¹The CSO staff in Philadelphia consisted of one military officer and 12 civilians. Caretaker-obligated funds for FY 1995–FY 1998 amounted to \$20 million.

¹²The costs reported in this section are the actual, direct costs of closing the shipyard and maintaining it until transfer to the city. NAVSEA and NAVFAC provided these costs. We did not independently validate the costs provided by the Navy.

yard had 7,371 employees. Of these, 1,299 were placed in other DoD or federal organizations under the PPP; 683 had their functions transferred to other Navy activities; 1,825 chose incentives for early retirement; and 1,817 left the shipyard through normal attrition. Only 1,747 employees were actually released through reduction in force (RIF) actions (see Figure 5.1). The civilian personnel-related costs included the retirement incentives (which were as high as \$25,000), permanent change of station moves, and severance payments.

The NAVSEA costs related to equipment and facilities were for preserving the equipment for potential reuse, removing excess equipment that the LRA did not want, and laying up the buildings according to BRAC and NAVFAC standards.

NAVSEA was responsible for several other functions during the shipyard closure. These functions included the consolidation of all national foundry-related work to the Foundry and Propeller Center

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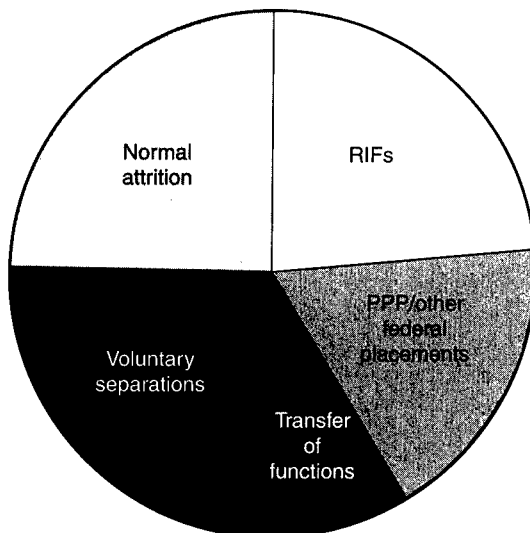


Figure 5.1—Final Status of Shipyard Employees

and establishing the center as a stand-alone detachment at the Norfolk Naval Shipyard and transferring shipyard equipment associated with unique functions to other naval shipyards and activities. The costs for these various functions are shown in Table 5.2 under Unique Functions.

Other costs shown in Table 5.2 are for the relocation of the tenants of the shipyard and the closure of their facilities (required by BRAC guidelines), salaries and support costs for the personnel associated with the financial closure (Postclosure Residual Functions), transferring money to the Naval Surface Warfare Center when it assumed utility, police, fire, and security functions (Other Costs), and for environmental compliance.

Table 5.3 compares the NAVSEA-related costs associated with closing the three other naval shipyards impacted by BRAC—the Charleston Naval Shipyard (CNSY), Mare Island Naval Shipyard (MINSY), and Long Beach Naval Shipyard (LBNSY). After deducting the nuclear-related costs for CNSY and MINSY, the costs for closing Charleston, Philadelphia, and Long Beach were all very similar; closing Mare Island cost about 50 percent more than closing any of the other three.

Table 5.4 shows the NAVFAC costs associated with the closure of the PNSY. These costs are primarily associated with the management of

Table 5.3
NAVSEA Costs for BRAC-Directed Shipyard Closures
(thousands of dollars)

Cost Element	CNSY	MINSY	LBNSY	PNSY
Civilian Personnel	92,860	135,185	100,527	107,472
Nuclear Costs	123,899	116,502	0	0
Equipment Costs	998	7,726	1,824	7,693
Facility Costs	8,728	16,099	4,802	25,210
Unique Functions	0	16,087	1,505	32,351
Tenants (nonlabor)	0	31,989	7,782	10,602
Postclosure Residual Functions	314	2,218	3,703	5,441
Other Costs	46,556	63,685	50,890	13,781
Environmental Compliance	38,503	32,324	25,801	1,395
Total (FY 1994 to FY 1999)	311,858	421,815	196,834	203,945

Table 5.4
NAVFAC Costs of Closing the PNSY
 (thousands of then-year dollars)

Cost Element	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	Total
CSO	363	606	698	426	225	1,955
CSO Support		353	84	62	215	714
Security		597	691	1,180	329	2,797
Real Property Man- agement		2,722	3,197	1,042	868	7,829
Environment	43,799	17,864	7,266	5,768	0	74,697
Total	44,162	22,142	11,936	8,478	1,637	87,992

the shipyard facilities after the closure and with the environmental cleanup of the installation. They include expenses for such things as the salaries and support of the personnel in the caretaker site office, gate and roving guards (contracted), cutting grass, minor repairs of facilities, and the like.

By far, the single largest cost for NAVFAC is associated with the environmental cleanup of the shipyard. A detailed breakout of these costs is shown in Table 5.5.

Table 5.5
Environmental Cleanup Costs at the PNSY
 (thousands of dollars)

Environmental Project	Cost
Polychlorinated Biphenyl (PCB)	
Remediation	203
Asbestos Abatement	26,831
Basewide BRAC Cleanup	448
Surveys, Leases, Transfers	2,247
Fuel Farm Contamination	
Remediation	31,549
Building 694 Underground Storage	
Tank Contamination Remediation	364
Lead-Based Paint Remediation	805
One-Time Compliance Projects	12,250
Total	74,697

OTHER CLOSURE-RELATED COSTS

Although not a cost to the Navy, and not a cost associated directly with the closure of the shipyard, more than \$165 million in grants were provided to local authorities for the reuse planning of the entire naval complex (hospital, naval station, and shipyard). These grants include more than \$105 million from the DoD's Office of Economic Adjustment (OEA), more than \$14 million from the Department of Commerce's Economic Development Administration (EDA), and almost \$46 million from the Department of Labor.

**FIRST ATTEMPT AT A PRIVATE SHIPYARD:
MEYER-WERFT**

INITIAL CONTACT

In the hope of finding a major company to occupy the shipyard, Philadelphia courted several foreign shipbuilders throughout late 1994 and 1995. The most prominent among them was Bernard Meyer, CEO and owner of Meyer-Werft, a private German shipbuilder with a 200-year history and a 25 percent share in the profitable gas tanker and cruise ship market. Meyer first toured the PNSY in September 1994 to explore the possibility of building a fleet of high-speed ocean freighters at PNSY for FastShip Atlantic, Inc., a company that planned to base its fleet in Philadelphia.

Mayor Rendell became personally involved in the early negotiations with Meyer, and New Jersey Gov. Christine Whitman, Pennsylvania Gov. Tom Ridge, and U.S. Sens. Arlen Specter and Rick Santorum all assigned staff members to work on the project of enticing Meyer-Werft to Philadelphia. For his part, Bernard Meyer expressed his belief that the time was ripe for the United States to get back into commercial shipbuilding, or at least that part of the business that focused on specialized, technology-laden ships, such as the ones his company produced (Holcomb, 1995a, p. C01). He also faced severe limitations for future growth in his Papenburg, Germany, facilities.

NEGOTIATING OBSTACLES

A number of obstacles stood in the way of a deal that would bring Meyer-Werft to Philadelphia, including financing, worker training,

state and local politics, resistance from U.S. shipbuilders, and a pending international antisubsidy agreement.

Financing

To obtain the more than \$400 million in investments, loans, and tax inducements needed to make the deal happen, Philadelphia required assistance from the federal and state governments and, possibly, the Delaware River Port Authority (DRPA), as well as Meyer-Werft and other private investors. Such funds would cover major improvements at the shipyard, including a huge shed over the largest drydock, and other changes to make the yard comparable to operations in Papenburg (Holcomb, 1995a). By February 1995, the city's ODC had come up with \$25 million in state and city funds. It was hoped that the remaining \$375 million-plus would come from a mix of private and public sources that the city hoped to tap, such as U.S. Department of Labor and the EDA. However, the mix of funding sources was not clear at the time (Fabey, 1995, p. 12B).

Worker Training

Meyer-Werft initially expressed some concern about the ability of workers steeped in military yard practices to adapt to working in a private yard, which required employees to be less specialized in their skills and be willing to take on a variety of tasks (Holcomb, 1995a). In an attempt to allay Meyer-Werft's concerns about U.S. shipyard workers, John F. Meese, president of the Metal Trades of the AFL-CIO, and top union officials signed a preliminary agreement on January 19, 1995, giving their assurance that union workers would adapt to manufacturing processes used in Meyer-Werft's German facility (Holcomb, 1995c, p. E01). In return, Meyer-Werft promised to pursue a \$50 million grant from the U.S. Department of Labor, as well as the support of Philadelphia-area educational institutions, to teach prospective employees the shipbuilding techniques the company had developed in its Papenburg shipyard (Holcomb, 1995g, p. C01).

Regional Politics

The complexity of politics in the Philadelphia region delayed the negotiating process. Critical political support for the Meyer-Werft

project depended on powerful Philadelphia Democrats and the new Republican administration in Harrisburg. The cooperation of New Jersey political leaders from opposing parties was also important. On the plus side, the potential benefits of a Meyer-Werft deal would be spread over three states, a half-dozen congressional districts, 10 counties, scores of cities, and hundreds of businesses. Yet no single, powerful benefactor had an overwhelming reason to bring the deal to a close (Holcomb, 1995f, p. F01).

Working in parallel, regional labor leaders sought support from area congressmen and the U.S. Labor Department for worker retraining funds and loan guarantees to Meyer-Werft's future customers. In spring 1995, this group met with Labor Secretary Robert Reich, who expressed interest in helping Philadelphia workers learn Meyer-Werft's manufacturing methods (Holcomb, 1995e, p. E01).

Nevertheless, this multifaceted lobbying effort could not prevent delays in the negotiation process. The slow pace of negotiations made it virtually impossible for Meyer-Werft to build ships for the customer that attracted it to Philadelphia in the first place, FastShip Atlantic. To get that contract, Meyer-Werft would have to complete its deal with the city in less than half the 120 days envisioned by the city. Otherwise, FastShip would miss the May 1, 1995, deadline for obtaining critical federal assistance for the project (Holcomb, 1995c).

Resistance from U.S. Shipbuilders

U.S. shipbuilders presented an obstacle to a Meyer-Werft deal through their influence with the Navy and the Congress. Some feared the introduction of Meyer-Werft would make it even more difficult for U.S. shipbuilders to reestablish themselves in the commercial shipbuilding market. Other arguments centered on the existing excess of shipbuilding capacity in the United States (Holcomb, 1995c).

Antisubsidy Agreement

Another deal-related complication was with the negotiators' belief that they were working against a December 31, 1995, deadline. After that date, it was envisioned that most government shipbuilding sub-

sidies, such as those that Meyer-Werft was demanding, would be prohibited under an international treaty, on which the United States and most of the world's major shipbuilding countries had provisionally agreed (Holcomb, 1995j, p. A01). However, this potential deal breaker turned out to be a nonissue when the United States suddenly backed out of the agreement under pressure from the domestic shipbuilding industry, which feared that the treaty might jeopardize the subsidies it received for the construction of military vessels (Philadelphia National, 1997).

ALMOST DEAL

Despite the obstacles to a deal, in April 1995, Meyer-Werft presented a detailed \$497 million proposal to create a civilian shipbuilding industry on the grounds of the PNSY. According to the financial plan, the shipbuilder agreed to put up \$230 million in private investment in exchange for \$270 million in subsidies by the state of Pennsylvania, and possibly the DRPA, in addition to federal and city grants. The leadership of Philadelphia supported the proposal, and it also won key support within Congress and the Clinton Administration, especially from Labor Secretary Robert Reich (Holcomb, 1995i, p. 7B).

However, several concerns were raised by the state of Pennsylvania about the Meyer-Werft proposal. These concerns included the share of financial risk between the public and private sectors, the spreading of the project's costs over 28 years versus the state's preference of four years (thereby reducing interest costs and reducing the state's contribution to the project), and the proposal to create a new subsidiary of the DRPA to build and own the shipyard and hire Meyer-Werft to run it under contract.¹ As an alternative to DRPA involvement, the state urged Meyer-Werft to consider a federal Maritime Administration (MARAD) loan guarantee under Title XI, even though this would mean competing with one of its potentially biggest customers, FastShip Atlantic, which was also seeking a Title XI loan guarantee from MARAD (Holcomb, 1995f).

¹Meyer wanted to take advantage of the bistate agency's low-interest borrowing power.

In May 1995, Meyer-Werft changed its initial proposal to accommodate some of the concerns. For example, the company accepted the idea of a dramatically reduced role for the DRPA. The company also proposed to finance a portion of its private debt with a \$179 million loan guarantee from MARAD under Title XI and to raise another \$51 million from its German parent and other investors (Holcomb, 1995g). The new one largely overcame the opposition to the original plan (Holcomb, 1995h, p. E01).

BENEFITS AND RISKS

To Meyer

There were a number of reasons why Meyer-Werft was interested in coming to PNSY despite obstacles to reaching an agreement with all parties. As a builder of large, technologically advanced ships, Meyer-Werft needed large drydocks and steel fabrication facilities. Its shipyard in Papenburg was constrained geographically for further expansion, and the Philadelphia Shipyard was one of only two private shipyards on the east coast of the United States to have such facilities.² Also, Philadelphia's location was attractive to Meyer-Werft. The company had identified scores of suppliers in Pennsylvania and New Jersey that could provide the \$100 million worth of goods and services needed for each ship it planned to build. Labor costs in the United States were less than in Meyer-Werft's home base in northern Europe. Finally, as a result of the Jones Act of 1920, a section of the shipbuilding market—ships built to carry cargo and passengers between U.S. ports—was reserved for U.S. shipyards. Prospects for new cruise ship orders in the United States were strong, and the faster ships in which Meyer-Werft specialized made it desirable for passengers to depart on cruises from mid-Atlantic ports, such as Philadelphia, rather than Miami (Holcomb, 1995d).

On the downside, Meyer-Werft disliked the idea of accepting a large debt in government-guaranteed loans in order to finance the reconstruction of the Philadelphia Shipyard. Although its American advisors downplayed the risk of these loans, Meyer-Werft reportedly

²The Tenneco shipyard in Newport News, Virginia, was the other facility with an aircraft-carrier-size drydock.

believed that the company's reputation would be severely damaged if it failed to repay its loans, even if the U.S. government covered the actual financial loss (Holcomb, 1995h).

Meyer-Werft and its investors faced two additional risks. The first concerned the price that new cruise and specialty cargo ships would command in the future. At the time of the Meyer-Werft negotiations, marginal operators using worn-out vessels were keeping down prices for new ships. The second risk involved the ability of PNSY workers to learn the Meyer-Werft system. The former shipyard's overhaul and repair work was actually more difficult than new construction, but it was organized quite differently from the Meyer-Werft system, where everybody worked as a team—and everybody and everything showed up at the right place, at the right time (Holcomb, 1995f).

To Philadelphia and Pennsylvania

Supporters of the Meyer-Werft deal in Philadelphia argued that its economic benefits could be substantial. One 1995 study indicated that, by the end of 1998, the Meyer-Werft shipyard could be providing 2,900 shipyard jobs, 2,300 supplier jobs, and 2,400 more indirect positions related to hotels, restaurants, and the like (*Philadelphia Inquirer*, 1995, p. A08). In addition, Meyer-Werft's activities were expected to generate about \$700 million in business revenue, including \$400 million in direct shipyard contracts, plus \$30 million in state, county, and municipal taxes. Others argued that a Meyer-Werft deal would have positive national (as well as local) repercussions. Thirty years ahead of the United States in terms of commercial technology, Meyer-Werft was one of the few privately owned companies among the world's top shipbuilders and its government-owned rivals would be unlikely to help the United States revive its moribund commercial shipbuilding industry (Holcomb, 1995l, p. A01).

On the downside, a summer 1995 report on the Meyer-Werft proposal by the Pennsylvania Economy League's eastern division raised several concerns about the deal. Although it praised Meyer-Werft's offer to share some of its profits with government investors, the report indicated that these payments would be voluntary and could be stopped at any time. In addition, concern arose that the shipyard improvements Meyer-Werft proposed would be so specialized that

only a limited number of tenants could make use of these facilities if Meyer-Werft went out of business or abandoned the yard (Holcomb, 1995j, p. A01).

UNRAVELING OF DEAL

Although the benefits of a deal appeared to outweigh the costs for both sides, Meyer-Werft abruptly withdrew its offer to build a commercial shipyard at PNSY after negotiations collapsed on the night of September 14, 1995. The immediate cause of the breakdown was a counterproposal by the state of Pennsylvania given to Meyer-Werft on September 11, which asked the German firm to put up \$50 million of its own money and to find an additional \$78 million from other private investors. Meyer-Werft believed the state's offer would have required the shipyard's private investors to accept a substandard return on their investment (Cassel and Williams, 1995a, p. A01).

Epilogue

The city of Philadelphia tried to salvage the Meyer-Werft deal. A proposal close to Meyer-Werft's initial offer was eventually crafted without funding from the state, largely through the efforts of Pennsylvania State Senator Vincent Fumo, who managed to pressure the DRPA to replace the funds that the state had declined to turn over. However, the fact that the Philadelphia region's only viable offer had resulted from last-minute power politicking made it unacceptable to Meyer-Werft. From Meyer-Werft's perspective, the company had sought a partnership with state decisionmakers, offering its expertise on shipbuilding in return for local leadership's expertise on what would work in the United States. Unfortunately, Pennsylvania state leaders had been unwilling or unable to accept the company's terms for a partnership (Holcomb, 1995m, p. E01).

KVAERNER: A DEAL IS STRUCK

NEW DEAL

Two months after Meyer-Werft discussions ended, Philadelphia began sending out feelers to the world's few remaining private shipbuilders. When the Norwegian construction conglomerate Kvaerner ASA showed interest, Pennsylvania's Commerce Secretary was sent to Europe to facilitate a deal. Key regional players reportedly cooperated with the city and state in forging a marketing plan that addressed Kvaerner's concerns about the competitiveness of the Philadelphia shipyard.¹

The result of the region's two-year courtship of Kvaerner was a memorandum of agreement, signed by Governor Ridge and Mayor Rendell on October 21, 1997, that provided the Norwegian firm a 99-year lease at the Philadelphia yard in return for a specific level of employment for the first 15 years (Davies, 1997). After intensive negotiations involving the commonwealth of Pennsylvania, city of Philadelphia, and the DRPA, which included discussions with the federal government—including then Vice President Al Gore—this provisional agreement was followed by a 545-page contract that was formalized in a signing ceremony at the Philadelphia Convention Center on December 16, 1997 (Kvaerner ASA, 1997a; Gorenstein, 1997c).

¹For its part, the DRPA pledged \$50 million in October 1997 for infrastructure improvements and job training to help broker a deal to attract Kvaerner to PNSY (Russell et al., 1997; Burney, 1997, p. 1B).

Kvaerner Description

In 1997, Kvaerner ASA was an international shipbuilding, engineering, and construction group, registered in Norway and headquartered in London, which employed more than 56,000 people worldwide and had annual operating revenues in excess of \$10 billion. Its core business units included shipbuilding, oil and gas, construction, metals, and pulp and paper (PIDC, undated pamphlet).

At the time of the Philadelphia deal, Kvaerner had only been in the shipbuilding business for about 10 years. Nevertheless, it had put together a diverse and profitable shipbuilding division with expertise in many different types of ships. It owned 11 modern shipyards in Finland, Norway, the United Kingdom, Germany, Russia, and Singapore, which employed about 11,500 workers (Kvaerner ASA, 1997b). Furthermore, the company's order book for new vessels stood at 7.9 billion Norwegian kroner (\$1.1 billion) at the end of 1996, while its shipbuilding division reported a 1996 pretax profit of 1.03 billion Norwegian kroner, mostly deriving from the Masa Yards Group in Finland (Porter, 1997, p. 6A). Kvaerner's recent expansion and apparent prosperity stood in stark contrast to the general situation of most of its shipbuilding rivals in Europe, which were downsizing, specializing, or simply going out of business in the face of stiff competition, primarily from Asia (*Journal of Commerce*, 1997, p. 6A). The exceptions were the European yards specializing in cruise ship construction including Kvaerner Masa, Meyer-Werft, Chantiers de l'Atlantique, and Fincantieri.

ELEMENTS OF THE DEAL

As indicated above, the deal between Kvaerner, Philadelphia, Pennsylvania, and the DRPA secured Kvaerner a 99-year lease (with the option to buy) on 114 acres in the former PNSY, including 500,000 square feet of existing buildings, utilities and infrastructure, and the two largest drydocks at the shipyard. Because the existing property was far from ready for utilization as a high-technology commercial shipyard, the contract stipulated that approximately \$560 million in investment for infrastructure development would come from the following sources:

- \$200 million—state government

- \$135 million—Kvaerner
- \$100 million—federal government
- \$65 million—DRPA
- \$60 million—city government loan to Kvaerner (Comegys, 1999, p. 11).

In exchange for the leasehold tract and the \$425 million in financial incentives, Kvaerner agreed to construct a state-of-the-art shipbuilding facility and to provide its Philadelphia employees with classroom training, overseas training, and extensive on-the-job training at the shipyard, building ships. According to the contract, the company was responsible for any cost overruns exceeding \$1 million during the construction of the new Kvaerner Philadelphia Shipyard. In addition, during the last 30 months of the transition period to full shipyard operations (October 1, 1998, to September 30, 2003), Kvaerner agreed to a workforce of no less than an average of 700 full-time employees per calendar year;² and to develop a supplier/sub-contractor strategy designed to assist regional suppliers and sub-contractors to become capable of being the primary provider of materials, products, and services to Kvaerner Philadelphia, Inc. (KPI). However, the Master Agreement also recognized Kvaerner's right to make supplier decisions on a business basis.

During the Transition Period, Kvaerner also agreed to construct three container ships (with capacity of 1,500 twenty-foot equivalent units [TEUs]) at the Philadelphia yard and to purchase these ships for an aggregate amount of \$80 million if no other buyer could be found. Furthermore, the contract specified that Kvaerner ASA, the parent company of KPI, would provide, free of charge, its subsidiary with a number of existing, modern, and relevant ship designs. In addition, Kvaerner ASA was obliged to furnish KPI employees management services and access to the parent company's other shipbuilding areas and research and development programs.

²In addition, the Master Agreement specifies that during the Initial Operating Period (period of 10 years commencing at the expiration of the Transition Period) Kvaerner agreed to a workforce of no less than an average of 500 full-time employees per calendar year.

For its part, the Philadelphia Shipyard Development Corporation (PSDC)—the organization set up by the state, city, and DRPA to assume direct ownership of the shipyard—had the right to “recapture” the property (i.e., cancel the lease and take possession of the Kvaerner tract) if KPI failed to employ at the shipyard an average of at least 200 full-time employees annually during any two consecutive calendar years. According to the Master Agreement, abandonment was deemed to occur if at any time KPI ceased shipbuilding activities at the shipyard for a period of nine consecutive months. In that case, the sole remedy of the PSDC and the other governmental parties would be to terminate the KPI lease and the Master Agreement.

Proposed Schedule

The following is a 1998 schedule of Kvaerner’s proposed activities related to the Philadelphia Shipyard from leasing to launch:

December 1997	Lease signed
January 1998	Begin design and engineering for renovations
Fall 1998	Commence construction
January 1999	Commence hiring and training of workforce
June 1999	Start construction of first ship
Fall 2000	Complete facility construction
Early 2001	Launch first ship.

ASSESSMENTS OF THE DEAL

Critics

Critics of the Kvaerner deal assailed the Master Agreement for a number of alleged failings. The *Journal of Commerce* noted that Kvaerner had promised to create about 1,000 jobs at the shipyard in return for \$400 million in public funds, whereas the failed deal with Meyer-Werft in 1995 would have required \$300 million in state and federal support and resulted in about 2,000 shipyard jobs (Russell,

1997, p. 2B).³ Subsequently, the same paper questioned whether the deal was fair to other shipyards, which would face a new, largely government-subsidized rival at a time of military cutbacks and fierce competition in the commercial sector. Moreover, the agreement appeared to violate the 1996 international antisubsidy pact because even though the United States had not yet ratified this treaty, it had pledged, along with the other signatories, not to increase shipbuilding subsidies while the pact was still pending (Sansbury, 1997a, p. 1A). According to his assessment issued in August 2000, the Pennsylvania Auditor General found that the Master Agreement imposed ambiguous obligations on Kvaerner and deferred the required performance of most of its obligations for several years, if ever. More significantly, it granted Kvaerner the right to abandon the project and escape responsibility for operating the shipyard and building ships, after having earned fees for constructing the yard at taxpayer expense (Phillynews.com, 2000).

Rebuttal

In response, Pennsylvania, Kvaerner, and Clinton Administration officials rose to the defense of the Kvaerner agreement. The new deal was better than the one with Meyer-Werft because Kvaerner guaranteed to build three ships at the yard, a pledge that translated into an immediate four years' worth of work; Meyer-Werft had not made such a commitment. Also, unlike in the Kvaerner agreement, cost overruns would have been billed to the state under the Meyer deal. Furthermore, Meyer-Werft's cruise ship market was more "volatile" than Kvaerner's container ship business. In a press conference, Governor Ridge asserted that state money for the Kvaerner deal would only be spent on job training and improvements to the yard. Consequently, the funds were focused on "permanent" assets, which would remain in Philadelphia even if Kvaerner were someday to leave the area (Russell, et al., 1997; Russell, 1997; Gorenstein, 1997a).

Kvaerner contended that once Pennsylvania and Philadelphia decided they wanted commercial shipbuilding at the former PNSY,

³For its part, *Forbes* magazine contrasted the Philadelphia deal and the reopening of naval shipyards in Baltimore and Charleston, which had cost taxpayers comparatively little (Spiegel, 1998).

they inevitably had to subsidize the operator. They believed subsidies were necessary to build a new ship facility in the current market (Gorenstein, 1997c). For his part, the U.S. Transportation Secretary defended the subsidy aspects of the Kvaerner deal against those who criticized it as being in violation of the Organization of Economic Cooperation and Development (OECD) pact (Sansbury, 1997b, p. 12A).

KVAERNER'S COMMERCIAL SHIPBUILDING PHILOSOPHY

The essential element of the pro-Kvaerner case was the company's promise to build a world-class shipyard that not only would save the jobs of PNSY workers and suppliers but would also help to reinvigorate the commercial shipbuilding industry in the United States. The Kvaerner Philadelphia Shipyard would be "the first modern yard built totally from scratch . . . the opposite of other yards, where some parts have been modernized and function very well while the rest remains a mess" (Holcomb, 2000b, p. C01). Kvaerner's goal was to create a shipyard that was 10 to 12 percent more productive than its top competitors. Initially, it would strive to become the leading producer of container and tanker ships for the U.S. market in addition to vying for international business in Europe and Asia. Later, Kvaerner planned to expand into the cruise ship market (FAS, 2000, p. 3). As a model for the Philadelphia Shipyard, Kvaerner had in mind the company's Warnow yard in the Baltic Sea port of Rostock in eastern Germany. The German yard had been completely overhauled after reunification in 1992 with the help of \$400 million in subsidies and had become one of the most modern shipyards in the world, delivering four container vessels in its first full year of operation (Comegys, 1999, pp. 10–11).

Shipbuilding Strategy

Essentially, Kvaerner's strategy for making money in the hypercompetitive shipbuilding industry involved using a highly trained workforce to build complex vessels with high profit margins. The following are the major components of this strategy as spelled out in a January 2000 KPI briefing:

- Pursue specialty tonnage;

- Lead with cutting-edge technology;
- Focus on core competency;
- Invest in first-class facilities;
- Continuously train workforce;
- Partner with local suppliers and create a supplier network;
- Develop complementary yards; and
- Take advantage of corporate size, strategic worldwide locations, and synergy within Kvaerner (Kvaerner Philadelphia Shipyard, 2000).

Team Approach

Under Kvaerner's team approach to shipbuilding, all its shipyards focus on what they know best—building the ship's hull and managing and integrating the outfitting of the ship. Nearly all the other components of the ship were manufactured and assembled by subcontractors and then delivered to the yard precisely when needed. Within the shipyard, teams of highly trained workers were provided with first-class facilities and organized around core processes, rather than trade skills. Outside the shipyard, Kvaerner relied on teams of suppliers, selected for their innovative ideas and desire to enter into a partnership with the firm, rather than their low bid offers. As with its in-house teams, Kvaerner expected its supplier teams to focus on their core competencies. In contrast to the typical acquisition system that involved one customer and many suppliers, the Kvaerner team approach involved a few prime suppliers, each having a manageable number of subsuppliers. These prime suppliers were responsible for providing the shipyard with "turnkey" components and systems precisely when they were needed (Kvaerner Philadelphia Shipyard, 1998).

BENEFITS TO KVAERNER

Aside from the federal loan guarantees and funds for job training and capital improvements, Kvaerner's interest in Philadelphia was generated by the availability of the former Navy yard's giant drydocks

and the absence of what Kvaerner considered significant American competition, especially in the market for Jones Act and ultimately Passenger Services Act ships.

Drydocks

According to some, Kvaerner was primarily lured to Philadelphia by the shipyard's pair of 1,092-foot drydocks. Built during World War II, these drydocks can comfortably accommodate the construction of ships up to 900 feet in length and up to 130 feet in beam (the maximum beam for a ship to traverse the Panama Canal is 105 feet).⁴ Furthermore, these docks are the only ones of their size between Maine and Virginia and would be next to impossible to duplicate today because of environmental constraints and high costs. In 1999, real estate appraisers hired by the Navy estimated the cost of replacing the principal Philadelphia Shipyard drydocks at between \$100 million and \$175 million each (Snyder and Cremers, 1999, p. 36).

Jones Act

For Kvaerner, the Philadelphia Shipyard had an immediate market niche. That niche was the market for Jones Act ships that Kvaerner anticipated to grow to \$4 billion over 10 years.⁵ Kvaerner considered this a target market because of the age of the ships currently operating in the domestic or Jones Act market. Kvaerner expected to win the lion's share of this market because its American competitors did not have access to the modern commercial technology and facilities and the manufacturing techniques that Kvaerner had developed in its European yards.

⁴The drydocks would be a tight fit for building 1,000-foot-long supertankers, however.

⁵Formally titled the Merchant Marine Act of 1920, the Jones Act supports U.S. maritime and shipbuilding industries by requiring that ships operating between the continental United States and Puerto Rico, Hawaii, Alaska, and Guam be built in the United States and crewed by Americans.

AFTERMATH OF THE 1997 KVAERNER CONTRACT

KVAERNER RESTRUCTURING

Less than a year after the signing of the Kvaerner-Philadelphia Memorandum of Agreement, Kvaerner ASA underwent a profound restructuring that did not appear to augur well for the future of the Kvaerner Philadelphia Shipyard. On October 14, 1998, the Kvaerner CEO who had negotiated the Philadelphia deal was forced to resign after Kvaerner's stock lost roughly 85 percent of its value during the previous fiscal year.¹ A variety of factors were responsible for the decline in value of Kvaerner shares. Many financial analysts blamed Kvaerner's woes primarily on its \$1.5 billion acquisition in 1996 of Trafalgar House, a British conglomerate with interests as diverse as construction and the Cunard cruise company. This acquisition greatly increased Kvaerner's debt. In addition, in 1997, the firm miscalculated its bid for a series of cruise ships, winning the contract for its Masa yard but taking a \$26 million loss. Furthermore, the advent of the Asian economic crisis had depressed the shipbuilding business worldwide. On top of that, Kvaerner's subsidiary that built oil- and gas-production equipment for the offshore petroleum business had suffered large losses (Barnard, 1998, p. 13A). Indeed, Kvaerner's 1998 financial statement indicated that, with the exception of construction, all business areas had experienced decreased performance during the previous year (*Kvaerner Network News*, 1999).

¹Kvaerner's stock price fell from \$29.25 on October 21, 1997, to a low of \$4.05 on October 7, 1998 (Gorenstein, 1998b).

Exiting the Shipbuilding Business

Kvaerner's response to its weak performance was to undertake a comprehensive review of the corporation's strategic direction. As a result of its review, Kvaerner ASA announced on April 13, 1999, that it was getting out of the shipbuilding business to focus on engineering, contracting, and construction. Although Kvaerner's shipbuilding division was profitable, margins had been falling over the previous two years and excess global capacity in this industry would dampen the company's profitability for the foreseeable future. Thus, Kvaerner was considering three alternative strategies: spinoff of its shipyards—which were thought to be worth between \$530 million and \$775 million—to Kvaerner's shareholders, sell them to another company or companies, or enter into joint venture agreement with another shipbuilder that would reduce Kvaerner's shipbuilding investment (Barnard, 1999a).

Although market strategists praised the Kvaerner restructuring plan—which was expected to generate annual cost savings of one billion kroner and raise 3.5 billion kroner (\$452 million) from asset sales (*CNN Financial Network*, 1999)—the consequences of Kvaerner's corporate downsizing for the newly acquired Philadelphia Shipyard were not entirely clear. On April 15, 1999, Kvaerner indicated that the Philadelphia yard would be packaged for sale along with its four largest and best-performing yards in Finland, Germany, and Norway (Warner, 1999b). In fact, Kvaerner executives in London were already negotiating with two potential buyers, one that was subsequently identified as Aker Yards, the shipbuilding arm of the Norwegian holding company Aker RGI (Barnard, 1999c). A few days later, however, Kvaerner sought to reassure Philadelphians that, despite its desire to exit the shipbuilding business, it would continue to operate the Philadelphia yard so long as a buyer suitable to the city and state could not be found (Holcomb, 1999a). The promise was confirmed by Kvaerner's statement that the company was legally committed to building ships on the Delaware (Barnard, 1999b).

PENNSYLVANIA'S AND PHILADELPHIA'S RESPONSE

Pennsylvania's general counsel asserted that the December 1997 Master Agreement with Kvaerner obligated any new buyer to con-

tinue with the Philadelphia Shipyard project. Furthermore, the state had purposely structured the agreement to include Kvaerner ASA, and not just its Philadelphia subsidiary, to preclude the easy abandonment of the yard (Warner, 1999a).

The prospect of losing the shipyard, after several years of hard work in bringing a world-class shipbuilder to Philadelphia, made government officials more interested in KPI's problems, in particular, the cost overruns that it was experiencing in the construction of the new yard.

Feasibility Study and Cost Overruns

Prior to signing the Kvaerner-Philadelphia Master Agreement, PIDC had provided Kvaerner Masa-Yards Technology in Finland \$100,000 to conduct a feasibility study to determine the cost of modernizing the shipyard. As subsequently reflected in the December 1997 contract, the scope of the construction project was defined as follows:

- Refurbishment of portions of the old steel shop that would be used for the fabrication line as well as the pipe, sheet metal, machine, and bow and stern shops;
- Construction of an addition to the old steel shop for the flat and curved panel lines;
- Construction of new buildings for the block, the block outfitting, and paint shops;
- Installation of a new 600-ton gantry crane over Drydock 4;
- Renovation of the drydocks; and
- Implementation of various other yard improvements, including installation of a cover over a portion of one of the drydocks and the construction of a new administration building.

According to Kvaerner's Feasibility Study, the total cost of the construction project was estimated at \$242 million, which included \$45 million for preliminary development. Over the next year and a half, however, the estimate of initial investment cost increased by \$59.6 million. The following factors largely accounted for the cost increase:

- Kvaerner determined that the crane capacity and process flow in the old steel plant was inadequate and would require additional pilings to withstand projected floor loading. This would have increased refurbishment costs. Therefore, a decision was made to demolish the old steel building and develop an entirely new integrated fabrication/panel shop. As a result, the number of steel process lines increased from two to four and overall steel throughput in the panel and fabrication shops was increased from 25,000 tons per year to more than 40,000 tons per year with minimal additional investment in the fabrication/panel shop.²
- Kvaerner determined that the soils data assumed as part of the Feasibility Study did not accurately reflect the Philadelphia site. Even though the PIDC provided Kvaerner with soil boring data originally obtained for Meyer-Werft, the Feasibility Study assumed the same soil conditions as the Warnow yard in Germany. The soil conditions at Philadelphia were in fact much poorer than at Warnow and therefore required deeper (90 to 120 feet) and more pilings.
- The building and safety code in Philadelphia required about 30 percent more steel in buildings than was required for the Warnow yard in Germany and assumed in the Feasibility Study.

Two other changes, which were not part of the cost overrun, were funded separately. These were as follows:

- The large gantry crane over Drydock 4 had to be reduced in height from 68 meters to 64 meters because of restrictions imposed by the nearby Philadelphia International Airport.
- The purchase of local steel resulted in higher steel costs than could be obtained on the world market.

Amendment to the Master Agreement

With the realization that the shipyard construction would cost substantially more than originally forecast, both Kvaerner and regional

²According to Kvaerner, the increase in throughput was a by-product of the redesign process and not the cause of it.

authorities faced a dilemma: The Master Agreement indicated that Kvaerner was responsible for any overruns over \$1 million, but Kvaerner was now in a precarious financial condition. On the one hand, any attempt not to honor its contractual obligations would likely result in a government lawsuit that, if successful, could potentially bankrupt Kvaerner. On the other hand, if the government pushed too hard, Kvaerner might decide to walk away and take its chances in court. Consequently, a compromise was reached. According to the Amendment to the Master Agreement, signed on July 30, 1999, Kvaerner was authorized:

- To transfer \$3 million from the Preliminary Development Budget to the Initial Construction Budget;
- To borrow \$50 million from Training Program Funds for purposes of initial construction;³
- To slip the date of the start of first ship production from June 1999 to April 1, 2000;⁴ and
- To make certain changes to the project scope, including elimination of the cover over Drydock 4 and the administration building.

As a result, the total financial incentive package provided to Kvaerner increased from \$429 million to \$438.6 million.

Although the Amendment to the Master Agreement solved the immediate problem of the construction cost overruns and soothed differences between Kvaerner and its government partners, it provided further ammunition to critics of the Kvaerner Philadelphia Shipyard project. According to Pennsylvania's Auditor General, the Amendment to the Master Agreement compounded the flaws of the original contract by granting Kvaerner the right to abandon the project even earlier and by further deferring the required performance of Kvaerner's obligations. The amended Master Agreement did require Kvaerner to pay back the \$50 million transferred from the training

³To keep the training fund whole, Kvaerner must repay the \$50 million by 2003 either through the sale of ships or from the parent company.

⁴Subsequent milestone dates were also slipped by approximately one year.

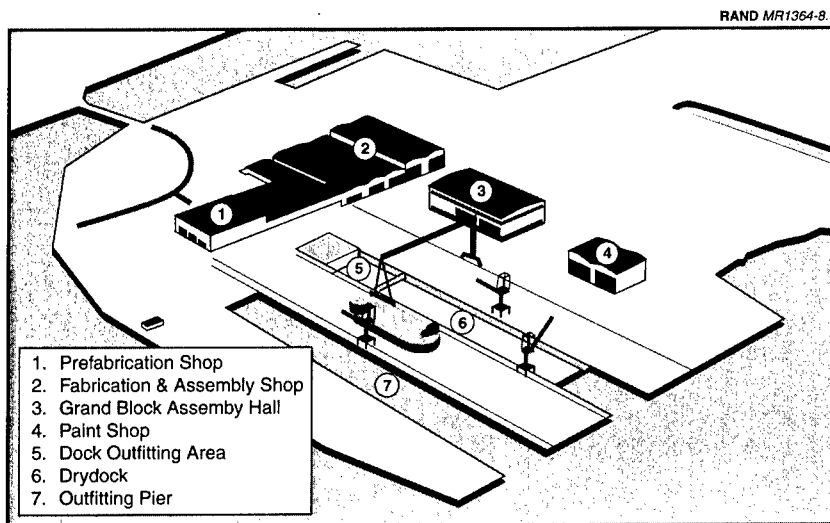
funds and inserted stronger warranties and a confession of judgment in the event of any default by Kvaerner.

PROGRESS AT THE SHIPYARD

In spite of its financial difficulties and initial cost overruns, Kvaerner Philadelphia has nonetheless made considerable progress in the areas of worker cooperation, shipyard reconstruction, and shipbuilding. Figure 8.1 is an illustration of the Kvaerner Philadelphia Shipyard site and its major component facilities.

Labor Agreement

When they took charge of the Philadelphia Shipyard at the end of 1997, Kvaerner management observed that, while former PNSY workers were highly skilled on the whole, some individual skills would “have to be extended a bit,” and their ability to work as a team improved, before the new yard could match the standards of pro-



SOURCE: PIDC, undated brochure.

Figure 8.1—Kvaerner Philadelphia Shipyard Site

ductivity and efficiency of Kvaerner's European shipyards (Gorenstein, 1997c). In particular, Kvaerner officials took aim at typical U.S. union work rules that inhibited workers from adopting a variety of skills and working within a structure that emphasized detail, efficiency, and cooperation (Gorenstein, 1997a). Without a new kind of labor agreement, they claimed, Kvaerner could not be expected to achieve the productivity and profitability goals necessary to survive in the highly competitive shipbuilding industry.

Responding to Kvaerner's challenge, the Philadelphia Metal Trades Council⁵ signed a five-year contract on September 4, 1998, with the shipbuilder that abolished traditional work rules for approximately 1,000 area machinists, welders, iron workers, sheet-metal workers, electricians, carpenters, painters, and pipefitters. Under the agreement, which took six months to negotiate, workers with a specific skill would be hired and then provided training in related skills. Kvaerner expected that it would take five years to have a completely "multiskilled" workforce that could compete for contracts against low-cost Asian producers and experienced, more efficient European yards. During this period, workers' wages—which would range between \$12 and \$18 per hour (plus benefits)—would be paid with government training funds. Blue-collar hiring was to begin in January 1999. For its part, the Metal Trades Council wanted former shipyard workers to be given priority. Although Kvaerner agreed to give PNSY workers first consideration, the company reiterated its right under the Master Agreement to hire any person it believed was qualified (Gorenstein, 1998a).

All interested parties reacted positively to the fall 1998 labor agreement. The union contract was a very important element in reopening the yard. As for Kvaerner, it was pleased to land a single union contract with the Metal Trades Council rather than negotiate multiple deals with different unions (Davies, 1998). In a commentary in the *Journal of Commerce*, John Meese, president of the Metal Trades Council, favorably contrasted Kvaerner Philadelphia's approach to labor with that of the Avondale Shipyard in New Orleans (Meese, 1998, p. 6A).

⁵The Metal Trades Council is the umbrella coordinating and interfacing organization for approximately 19 separate unions.

Nearly two years after signing the labor agreement, officials at the Metal Workers Union in Philadelphia continued to view the European model of multiskill training favorably, but they found that Kvaerner executives harbored certain misperceptions about U.S. unions and U.S. laborers that would hopefully change. More positively, labor officials agreed that the hiring process had proceeded fairly smoothly. By summer 2000, Kvaerner's workforce numbered 218 employees, 105 of whom were blue-collar workers and the rest engineers, planners, and design and administrative/support personnel. About 60 percent of blue-collar workers were ex-Navy shipyard employees. By fall 2001, Kvaerner planned to increase its Philadelphia workforce to approximately 900 before reducing the number to about 700. If suppliers are included, the virtual blue-collar workforce may eventually be larger than it was in the naval shipyard.⁶

Shipyard Reconstruction

Preliminary development work commenced at the new Kvaerner yard in January 1998. Five months later and slightly ahead of schedule, Kvaerner signed a \$4 million contract with Philadelphia Shipyard Engineering, a joint venture among several local architectural and engineering firms, to coordinate the design of the shipbuilding installation. At the same time, a team was dispatched to Europe to buy \$100 million in heavy shipbuilding equipment for the yard (Fernandez, 1998). On August 4, 1998, Vice President Al Gore, Governor Tom Ridge, and Mayor Ed Rendell attended the "building breaking" ceremony that marked the official beginning of construction on the new Kvaerner Philadelphia Shipyard facility. By early 2000, the shipyard was about three-quarters complete, and work was under way to complete the structural steel and enclose the Grand Block Shop, enclose the Paint Shop, and complete the site work. In addition, the Goliath Gantry Crane, the slewing cranes, and other shipbuilding equipment were being tested and commissioned.

Designed by the same team that built the production facilities at Kvaerner's showcase installation in Germany, the Kvaerner Philadelphia is even more advanced than Warnow Werft. Not only does it

⁶Interview with Philadelphia union official Phil Rowan, July 26, 2000.

embody the lessons learned at both Warnow and Kvaerner's new Masa Yard Finland, the KPI facility houses the most sophisticated equipment available for building commercial ships. Key production machinery includes:

- A DNC plate-cutting system with five units integrated to corresponding production lines and shops;
- A profile processing system integrated to the main production lines, including off-line robotic cutting equipment;
- Three advanced bending machines, two with a 600-ton maximum capacity each, and one with a 1,270-ton maximum capacity;
- Flow lines for small, medium, and large stiffened panels and double-hull structures, including straight and curved plates and profiles;
- A robotic welding system capable of performing precision welds on six axes; and
- An extensive network of remote-controlled cranes and heavy transporters (Blenkey, 2000, pp. 35 and 38).

Shipbuilding

Having sought and been denied a second delay in the start of ship construction, Kvaerner stuck to its revised contract and began building its first ship on March 31, 2000. This initial vessel, a "Philadelphia CV2600" model cargo ship, will carry the equivalent of 2,600 20-foot containers. Kvaerner had planned its first ship to be about half that size, but carriers hauling cargo between U.S. ports apparently prefer a larger vessel that can carry a variety of container sizes. If all goes as planned, the first CV2600 will deliver in summer 2002 (Holcomb, 2000d).

CONTINUING PROBLEMS

Despite steady progress in several important areas, the Kvaerner Philadelphia Shipyard faces significant problems regarding the extent of its foreign purchases, its lack of ship sales, its parent com-

pany's inability to sell the shipyard and lingering heavy debt, and, most recently, an audit that alleges supposedly "wasteful" spending of KPI executives.

Foreign Purchases

For the past two years, regional politicians have criticized Kvaerner for going outside the United States for many of the required goods and services necessary for the reconstruction of the Philadelphia Shipyard. For example, a state senator from the Pittsburgh area attacked Kvaerner's decision to spend \$28 million to buy a Portuguese-made gantry crane. In response, Kvaerner indicated that the company had made every effort to buy American but would turn to the international market when necessary to transform the yard into a global competitor. Among the items that Kvaerner has stated it needs to purchase abroad are propulsion units, engines and control systems, profile steel, pumps, alarm systems, diesel generators, navigation equipment, radio communications, rudder systems, radar apparatus, discharge systems, propellers and shafts, winches, windlasses, ships' logs, depth-sounding equipment, boilers, inert gas plats, electrohydraulic power racks, switchboards, panels, and consoles. Although this list appeared suspiciously long to some, shipbuilding experts have not found it surprising. Rather, they say, it is a clear indication of how far behind U.S. shipbuilding has fallen. Although most any shipbuilding component can be found in the United States, it may not necessarily be competitively priced, state of the art, or accepted as industry standard (Sansbury, 1998; Baldwin, 1999).

Lack of Ship Sales

A major disappointment for the new Philadelphia Shipyard came on December 6, 1999, when Seattle-based Totem Ocean Trailer Express announced that it had placed a \$300 million order for two 820-foot cargo ships with National Shipbuilding and Steel Company of San Diego rather than Kvaerner-Philadelphia. While some industry executives claimed that National Shipbuilding and other American yards had actively worked to keep the Philadelphia yard from landing its first order, some attributed Kvaerner's failure to the fact that the company had started later than National Shipbuilding and lost valu-

able time in the competition in spring 1999 when it announced its decision to sell its shipyards. For their part, Totem executives claimed that they had been cooperating closely with National Shipbuilding for five years under a federal ship-design program devised to help revive commercial shipbuilding (Holcomb, 1999b, p. E01).

With no buyers lined up for its first ship, Kvaerner itself placed an order in April 2000 for the Philadelphia yard's initial vessel, as required by its 1997 master agreement. However, Kvaerner also requested at the time that regional officials allow the company, if necessary, to purchase two large container ships instead of the three smaller vessels stipulated in the contract. Kvaerner's request was approved, particularly as the two larger ships would require more work hours and more steel than the initially planned three smaller vessels (Holcomb, 2000d).

The absence of a chief executive officer with shipbuilding expertise at KPI appeared to hamper the Philadelphia yard's efforts to sell ships. The yard's first CEO, Harald Rafdal, a finance expert, resigned in June 2000, after supervising the construction of the new facility. His temporary replacement was a London lawyer. It was not until October 2000 that KPI received a permanent chief executive, Ronald McAlear, with operations and marketing experience at a major U.S. shipyard. McAlear's background as vice president at the Litton Avondale Industries Inc. shipyard in New Orleans—where he supervised the building of nonnuclear Navy ships, civilian oil supertankers, Coast Guard icebreakers, and other ships—greatly heartened Philadelphia leaders, who undoubtedly wished for some indication that their investment in a state-of-the-art facility had not been in vain (Holcomb, 2000h, pp. D1 and D4).

Whether in response to McAlear's appointment or not, KPI appeared to be on the verge of its first major sale to an outside buyer at the end of 2000. After discovering that National Steel and Shipbuilding Co. of San Diego could not fulfill its order as previously promised, Philadelphia's FastShip Inc. signed a preliminary agreement in November to build its first four high-speed cargo ships at the Kvaerner Shipyard. According to FastShip's president, Roland Bullard, a formal construction contract could come as early as the first quarter of 2001. If so, the Philadelphia yard would move much more quickly than expected toward building cutting-edge vessels designed to carry

cargo twice as fast as conventional ships. However, Bullard conceded that a lot more work needed to be done until the contract was finalized, including the raising of additional capital for ship construction and start-up costs for FastShip's operations between Philadelphia and Europe (Holcomb, 2000i).

Inability to Sell Shipyards

Kvaerner's progress in selling its shipyards has been slower than expected. By summer 1999, Kvaerner had all but abandoned its plan to sell its major Finnish, German, and U.S. shipyards in a package and had begun attempting to peddle the three yards individually (Barnard, 1999d). By January 2000, the company had disposed of only five of its 13 yards, even though it had hoped to be entirely out of the shipbuilding business by that time. Still, Kvaerner was anticipating the imminent sale of its biggest yard, Kvaerner-Masa Yards in Finland, which accounted for more than 50 percent of its shipbuilding production. On the other hand, the sale of the Warnow yard in Germany was being delayed by Kvaerner's decision to appeal a \$42.7 million fine that had been levied by the European Community for violating conditions attached to state aid (Barnard, 2000a).

As for the Philadelphia Shipyard, a newspaper report in February 2000 indicated that two major shipbuilding firms from Singapore and Norway were in serious negotiations to take over KPI. Although the Norwegian company, Aker, seemed to be getting most of Kvaerner's attention, the government-owned Singapore Technologies Marine had lined up two members of Congress to rally public support behind its interest in the Philadelphia yard (Holcomb, 2000a, p. C01).

Kvaerner's difficulties in finding buyers for its shipyards exacerbated an already heavy debt burden. In 1999, Kvaerner set aside about 2 billion kroner (\$250 million) to try to sell its 13 shipyards. A year later, Kvaerner took an additional charge of 750 million kroner (\$94 million) against its 1999 earnings to quit the shipbuilding industry (Barnard, 2000b). Although committed to its decision to exit the shipbuilding business, Kvaerner appears to see Philadelphia as a shipyard with significant potential value. No decision has been made regarding a buyer for Philadelphia, Warnow, or the two Masa yards that remain.

Audit Report

To make matters worse, on August 9, 2000, the Pennsylvania Auditor General released an audit of the Kvaerner Philadelphia Shipyard accusing the firm of wasteful spending, among other infractions. According to the audit, PSDC provided Kvaerner nearly \$2 million in taxpayer funds for certain categories of expenses for top executives that reportedly included expensive homes, interior designers, posh furniture, and children's toys. In addition, it criticized the PSDC for failing to monitor Kvaerner's efforts to maximize the involvement of regional suppliers in the construction of the shipyard, which had resulted in the award of \$39 million in equipment contracts to foreign companies. One argument was that Pennsylvania companies received less than half of the construction dollars awarded as of October 1999, less than 2 percent of the equipment contract dollars as of November 1999, and none of the Information Technology contract dollars (Phillynews.com, 2000).

Kvaerner supporters quickly mounted a counterattack against the audit, calling the report "one-sided, short-sighted, [and] misleading." On the matter of Kvaerner executive perks, PSDC's counsel stated that an October 1998 audit by Ernst & Young had indicated that the allowances being paid to Kvaerner executives who moved to Philadelphia were "consistent with the general practices of multinational employers" and within the norms of "conventional benchmark standards." He also said that the report played down the fact the PSDC was paying allowances, subject to final audit, and that the questionable claims mentioned in the report had already been rejected (Pennsylvania, Commonwealth News Bureau, 2000).

Notwithstanding the questionable nature of the audit, the report has already had a negative impact on Kvaerner's relationship with its blue-collar workforce. Reportedly, shipyard workers had for some time quietly grumbled about perks given to the foreign executives of Kvaerner ASA. However, their unhappiness turned to anger when the report charging that public funds had been spent for expensive luxuries appeared. At the root of this anger was the fact that foreign executives appeared to be faring very well while many workers were earning far less than they had when the U.S. Navy had owned the shipyard. Unfortunately for Kvaerner, this rising resentment among its employees was coming at a time when it was beginning to attract

the interest of potential shipyard buyers and the company needed to hire 400 new workers to meet its construction schedule (Holcomb, 2000g, p. E01).

FUTURE PROSPECTS FOR THE PHILADELPHIA NAVAL BUSINESS CENTER

In spite of the uncertainty surrounding the future of the Kvaerner Philadelphia Shipyard, the PIDC has achieved some success in attracting private-sector industrial, office, and service companies to the former naval complex. Although many of the current tenants at the base have moved to the base from other parts of the Philadelphia area, more than half of them are either start-up companies or arrived from outside the region. PIDC's stated goal, however, is to attract new jobs to the region and to create an environment favorable to new business enterprises. The following are brief descriptions of four major tenants of the Philadelphia Naval Business Center (PNBC).⁷

Metro Machine

A highly regarded ship repair firm based in Norfolk, Virginia, Metro Machine signed a lease in 1995 for Drydock 4 and Pier 6 at the Philadelphia Shipyard, where the company intended to repair Navy support vessels and build double-hull oil tankers for the civilian market (Holcomb, 1995b, p. A01). In fall 1999, Metro was awarded its second five-year, \$150 million contract with the Navy to conduct regular maintenance and modernization on four underway replenishment ships. The first of these repair projects, involving the USS *Detroit*, began in March 2000 and was estimated to cost between \$65 million and \$70 million. Metro expected that the Navy award would bring 300 additional jobs to the shipyard (PIDC, 1999; Holcomb, 2000c). As a result, Metro has amended its lease and currently leases Drydocks 2 and 3 as well as Piers 5 and 6. In addition to the repair work, Metro is also engaged in a ship dismantling demonstration project for the Navy.

⁷For a more complete tenant listing, see Appendix B.

Northrop Grumman

A tenant at PNBC since November 1995, Northrop has expanded from a small group of test engineers testing the Intercooled Recuperative Gas Turbine at an adjacent Navy facility. Northrop has a manufacturing facility that may relocate to a larger site at PNBC for the manufacture of this engine. Northrop intends to assemble additional turbogenerator sets for the Navy at PNBC.

Alstom USA

In June 2000, Alstom USA became the first manufacturer of large maritime systems to become a resident of the PNBC. A subsidiary of one of the world's top makers of electric drives and controls, Alstom USA was drawn to Philadelphia, in part, to participate in the development and manufacture of hardened integrated power systems for the Navy's next generation of destroyers. Alstom had already succeeded in winning a large share of the market for such systems used on civilian cruise and cargo ships, having recently won a \$24 million contract to supply complete power packages for two cargo ships being built in San Diego by National Steel and Shipbuilding Co. Thus it also hoped to become a major supplier to the Kvaerner Philadelphia Shipyard. Given the Navy engineering station's pioneering work on integrated power technology and the Kvaerner yard's potential for building sophisticated ships, Alstom officials believed that Philadelphia could become the center of a new electric power and control industry (Holcomb, 2000f).

Prime Plate Enterprises, Inc.

Prime Plate occupies the former Building 763 in the Girard Point complex. It receives steel plate from Bethlehem Steel and then prepares and primes the plate for delivery to Kvaerner on a just-in-time basis. Other U.S. shipbuilders are also interested in using Prime Plate. It will employ 150 to 200 workers.

OBSERVATIONS

The preceding chapters have provided a chronology of the closing and reopening of the Philadelphia Naval Shipyard. The story has not yet reached a conclusion. Although the overall process of closing, transferring, and reopening the shipyard was difficult at times and faced a number of obstacles, there is hope that the result will benefit the Navy, the city of Philadelphia, and the people of the region.

The Navy has transferred a large portion of the former PNSY to the city of Philadelphia thereby eliminating the cost of maintaining excess ship repair capacity. Also, the two large drydocks remain in use and could be available if a national emergency requires the need for such scarce facilities.

The city of Philadelphia now owns a large industrial facility that not only contains the most advanced shipbuilding capability in the United States but also has numerous buildings and other facilities. Various tenants have been leasing a portion of the former shipyard, resulting in revenue to the city. These tenants also provide new employment opportunities that result in demands for local support services as well as income and wage tax revenue. They also procure utilities from the local providers. The new Kvaerner facilities represent the most modern shipbuilding capability in the United States. Spinoff opportunities, such as Prime Plate, have resulted as the Kvaerner supplier network progresses.

This last chapter provides some overall observations on the closure and reuse of the former PNSY. It discusses the lessons for future studies on the costs to shut down, maintain, and reestablish major shipbuilding facilities and equipment; the impact on the workforce

of closing and then reconstituting shipbuilding activities; and the commercial shipbuilding philosophy of Kvaerner. It concludes with a short discussion of the future of the former PNSY.

COSTS OF SHUTTING DOWN, MAINTAINING, AND RESTARTING A SHIPYARD

The main objective of this report was to understand the costs associated with shutting down, maintaining in a dormant state, and then restarting portions of a shipyard. This actual data point would prove useful in estimating the costs of various shipbuilding industrial base options that involve the temporary closing or mothballing of excess facilities and equipment. When examining the costs for this case study, it is important to keep in mind the following:

- Private shipyards may have taken an approach different from the philosophy used by the Navy in closing the PNSY. Some of the buildings at the PNSY were old and obsolete and the shipyard commanding officer realized there was little potential for their effective reuse. Although plans were formulated to demolish some of these facilities, the guidelines of the BRAC process resulted in efforts, and costs, on the part of NAVSEA and NAVFAC to shut down and maintain these facilities for transfer to the local community. This is especially true for the portion of the PNSY ultimately occupied by Kvaerner. Some of the older buildings were ultimately demolished to make way for the new ultramodern shipbuilding facilities. Private enterprises would have likely demolished any obsolete facilities to reduce the overhead costs associated with closure and maintenance.
- In shutting down the shipyard, NAVSEA efforts were directed toward transfer to the local community, not toward future reuse. The actions they took to preserve equipment and facilities, and the resulting costs, may have been very different if the Navy had a plan for their reuse. For example, minimal preservation efforts were expended on the drydocks and such heavy equipment as cranes. Larger efforts and costs would have been expended on the drydocks and heavy equipment under the original plans of the 1991 BRAC to close and preserve portions of the shipyard for future use.

- The reuse of a large portion of the former PNSY, the portion we have concentrated on in this report, involved the conversion from ship repair to ship construction. This new function for the shipyard required new facilities and equipment.

Even with these caveats, valuable lessons and data can be gleaned that should prove helpful in future analyses of shipbuilding contraction and expansion.

Costs of Shutting Down the Shipyard

At the time of its closure, the PNSY occupied approximately 300 acres of land with 25,000 linear feet of berthing space; five drydocks; 34 fixed, floating, or tracked cranes; and 171 facilities, including 23 fully equipped production shops. Of the 171 facilities, 52 were retained by the various Navy organizations that remained at the location and 119 were subsequently transferred to the city of Philadelphia. The vast majority of the buildings and facilities were built during World War I or World War II and many were in poor physical condition.

As shown in Tables 5.2 and 5.3, closure costs included the disposition of the civilian employees (more than 50 percent of the total closure cost at the PNSY), the preservation of buildings and equipment, compliance to environmental standards, and other miscellaneous costs. We will discuss the workforce-related costs shortly. Here, we concentrate on the equipment and facility costs, assuming these are the types of costs that a private shipyard would expend in closing down a portion of its facilities with a goal of future reuse.

Preparing the shipyard for closure involved preserving the equipment for potential reuse, removing excess equipment that the city did not want, and laying up the buildings according to BRAC and NAVFAC standards. A strenuous effort was required to organize and catalog a wide array of hand tools, minor equipment, and other items used for the repair and maintenance of naval ships. This included a substantial amount of household furnishings, including linens, used to support the crews of ships at the PNSY for long-term maintenance, such as the SLEPs. Much of the excess tools, equipment, and personal property were donated to local governments, technical schools, or charities.

NAVSEA spent more than \$30 million to place the buildings and equipment in a dormant state. This facility and equipment cost was the highest of the four shipyards closed by BRAC (see Table 5.3), partly because of the number of buildings and facilities and their age and condition. Although not a trivial sum, the costs of placing the facilities and equipment in a dormant state were relatively minor given the number of facilities and their combined square footage. However, as mentioned previously, the closure actions were not driven by the objective of future reuse by the Navy. For example, minimal preservation efforts were expended on the drydocks and cranes, with much of the major equipment receiving only a light coating of oil as a preservative. A private shipyard would likely have spent more time, effort, and cost in the preservation of major equipment intended for reuse. Nevertheless, the costs of closing down and preserving a portion of a shipyard are relatively minor.

Costs of Maintaining the Shipyard in a Dormant State

NAVFAC spent an average of \$3 million per year in personnel, security, and real property maintenance costs for the shipyard from FY 1997 to the time of transfer. Of these costs, approximately 40 percent were for caretaker personnel, their support, and facility security with the remaining 60 percent for the maintenance of the buildings and equipment. Again, the magnitude of these costs is relatively minor.

In addition to this data point for the costs of maintaining a portion of the shipyard in a dormant state, NAVFAC has a set of definitions and guidelines for the actions necessary to maintain facilities at various levels depending on the time frame of their intended reuse (see Table 5.1). NAVFAC developed cost standards relating closure and maintenance costs to various measures, such as dollars per square foot or dollars per estimated value, to help planners estimate the costs for facility maintenance under different reuse assumptions. These standards, along with NAVFAC experiences, are a useful starting point for estimating the cost of future shipbuilding industrial base actions.

Costs of Reconstituting the Shipyard

The costs of reconstituting the Kvaerner portion of the shipyard far outweighed the costs related to facilities and equipment of closing

the shipyard and maintaining it in a dormant state. Approximately \$45 million was spent on the preliminary development of reconstitution plans with an additional \$260 million for the actual demolition of old and excess buildings, the construction of new shipbuilding facilities, and the purchase of equipment (approximately \$100 million of the \$260 million). Some specific reconstitution actions include the following:

- Construction of a new fabrication shop (approximately 650,000 square feet) with 10 separate production lines. The shop includes state-of-the-art shipbuilding equipment such as plasma cutters, robotic cutters and welders, bending machines, and more than 20 cranes with capacities ranging from 10 to 120 tons.
- Purchase of a 600-ton gantry crane over the building drydock (cost of approximately \$30 million).
- Construction of a grand block shop for the assembly of modules of up to 600 tons before their movement to the building dock (cost of approximately \$30 million).
- Construction of a paint shop (cost of approximately \$10 million).
- Purchase of two medium and two heavy-lift transporters.
- Improvement or construction of roads, parking areas, and storage space.

It is important to note that very little money was spent on refurbishing the two drydocks. Because these are the types of facilities likely to be placed in a dormant state if private shipyards temporarily close down facilities with the intent of future reuse, this data point is useful.

There are two important caveats with the costs of reconstituting the Kvaerner portion of the old PNSY. First, the basic functions of this portion of the shipyard made the transition from ship repair to ship construction. This transition accounted for the large reconstitution costs. Although a private shipyard involved in building ships might have expenditures for some new equipment when reconstituting a portion of its shipyard, it would unlikely have the degree of new construction required by Kvaerner. Second, the existing buildings and facilities at the former PNSY were very old and in poor shape. As it

turned out, Kvaerner decided to demolish most of the existing buildings rather than attempt to refurbish them.

The other, non-Kvaerner, portions of the shipyard also required some fairly substantial expenditures to make the facilities suitable to new tenants. Some of the required actions and their costs include the following:¹

- Building 3 with a total area of 51,905 square feet is the proposed future location of a new Cruise Terminal. The intent is to spend approximately \$3.55 million (nearly \$70 per square foot) for structural repairs, interior improvements, and exterior improvements.
- Two tenants—River Associates and Moran Towing—occupy Building 25 with a total area of 53,188 square feet. River Associates spent approximately \$210,000 to improve the 22,150 square feet it occupies (approximately \$9.50 per square foot). Moran Towing spent approximately \$110,000 to improve the 4,024 square feet it occupies (approximately \$27 per square foot).
- Building 669 is occupied by Metro Machine, which uses it as a service building for Drydock 2 and Pier 5 for Metro's ship repair operations. The building was approximately 50 years old and in very poor condition. More than \$400,000 was spent in renovations, including roof repairs to make the building suitable for operations.

Similar caveats are important here—the buildings were very old and, in some cases, in poor physical condition and new tenants are often using the facilities for purposes other than those they were originally designed and built for.

The important lesson for the analysis of future shipyard contraction and reuse studies is that reconstituting portions of a shipyard can be fairly expensive, certainly more expensive than closing and main-

¹From *Philadelphia Naval Shipyard: Business Plan*, prepared for the Philadelphia Industrial Development Corporation by the E&Y Kenneth Leventhal Real Estate Group of Ernst and Young, December 1998. The costs presented are in some cases the actual costs expended to refurbish buildings and equipment and in other cases are estimates of the costs required. We did not independently validate the actual costs or estimates.

taining buildings and equipment. Costs will be greater if the facilities are old and have not been maintained properly and if the new uses for the buildings and equipment are very different from the original uses.

WORKFORCE IMPACTS

In addition to the costs related to the facilities and equipment, this report also evaluated the costs to terminate the workforce when the shipyard was closed and the costs to rehire and retrain the workforce when activities were restarted.

Workforce-Related Costs of Closing the Shipyard

The impact on the civilian employees of the shipyard was greatly reduced by the concerted efforts of the shipyard commander, NAVSEA, and the local and federal government. NAVSEA provided more than \$100 million in separation bonuses, relocation expenses, and retirement incentives for shipyard employees. This amounts to approximately \$15,000 per shipyard employee. When the shipyard finally closed, fewer than 2,000 of the more than 7,000 employees were left unemployed. Many of those 2,000 had employment opportunities that they declined.

At the federal level, more than \$160 million in grants was provided to the city and state for reuse planning and worker training. These grants covered the workforce at the naval complex, not just the shipyard. No data were available on the portion of the \$160 million that was directed toward the shipyard workforce. However, a portion of this grant money was included in the package of incentives provided to Kvaerner for workforce training. We will discuss these funds in the next subsection on retraining the workforce.

The costs associated with separating the workforce could have been higher if not for two factors. First, the growth in the overall economy of the United States and of the region during the mid-1990s and late 1990s was fairly robust, providing employment opportunities for the displaced shipyard workforce. Unemployment rates in the United States were approximately 4.5 percent in 1998, an improvement over the unemployment rate of 6.9 percent in 1993. Philadelphia and the

five surrounding counties had a higher (9.5 percent) unemployment rate in 1993 compared to the country as a whole (6.9 percent), but by 1998, the regional unemployment rate was 4.0 percent, or slightly less than the national average (Pennsylvania Labor Market, 2001).

A second mitigating factor was the new opportunities created by other BRAC actions that retained or relocated several Navy organizations to the shipyard property. These Navy organizations offered employment opportunities for approximately 2,000 civilians. Also, new tenants at the shipyard employed several hundred people.

Reconstituting and Retraining the Workforce

Kvaerner faced several obstacles when reconstituting the workforce at the shipyard. First, the former shipyard employees, although highly skilled, were experienced in ship repair not in shipbuilding. In ship repair, much of the work is directed at removing, repairing, and replacing components and subsystems or at the repair of relatively small portions of the ship structure. In shipbuilding, especially in the Kvaerner approach to shipbuilding, much of the work is directed at the construction of large assemblies or blocks, which are then joined to construct the hull, mechanical, and electrical portions of a new ship. Subcontractors perform much of the subsystem or component work (i.e., the outfitting of the new ship).

A second hurdle was the union rules that guided the skills and workforce relationships in U.S. shipyards. These rules typically prohibited workers from “crossing union lines” and, therefore, led to a highly disaggregated workforce. The Kvaerner approach to shipbuilding required its employees to learn a variety of skills and to work within a structure that emphasized detail, efficiency, and cooperation.

Recognizing the need for a new type of labor agreement for Kvaerner to succeed in the Philadelphia venture, the Philadelphia Metal Trades Council signed a five-year contract with the shipbuilder that abolished traditional work rules for Kvaerner’s new employees. The shipyard would hire people with specific skills, but training would be provided in related skills to lead to a multiskilled workforce.

Finally, the employment market at the time of the Kvaerner agreement was such that many of the former shipyard workers had new

jobs and jobs they were happy with. Unemployment was low both in the Philadelphia region and throughout the United States.

Recognizing the importance of workforce training, the Master Agreement included \$187 million in government funds for overseas, technical, and on-the-job training (OJT). The overseas training (at \$9 million) involved creating group and organizational productivity skills and improving vocational skills through hands-on training in Kvaerner's overseas shipyards. The plan for this training was to send 30 employees per year for three months to Europe starting in the third quarter of 1998. The overseas training program was to last for five years. As of this writing, 100 new employees have received overseas training.

The objective of the technical training (at \$10 million) is to reinforce the group and organizational productivity skills and the vocational skills through hands-on training and classroom instruction in training centers in the Philadelphia area. This training started toward the end of 1998 with production workers from Warnow brought to Philadelphia for periods of six months to a year. The training will be provided for approximately 350 employees through technical courses of two to five days in duration taken five times per year.

The largest portion of the training funds, \$168 million (of which \$38 million is for the training of administrative employees and \$130 million for the training of production employees), is for OJT. The objective of this training is to enhance the skills gained through overseas and technical training through the process of building ships at the new shipyard. The OJT is considered the most important part of the training program and the best way to achieve the objectives of the training program and to monitor and document that achievement. This training started with the construction of the first ship in March 2000. The total cost of the training program pays the salaries of employees and funds the other costs incurred in connection with the training program.

Kvaerner currently employs more than 500 local workers, more than half of whom are blue-collar workers and the remaining are engineers, designers, planners, or support workers. Approximately 40 percent of the current Kvaerner employees (approximately 60 percent of blue-collar workers) are former PNSY employees. Direct

employment by Kvaerner is planned to increase to approximately 1,200 by the first quarter of 2002. Employment projections by function for year six of the Master Agreement (2003) are shown in Table 9.1.² In addition to the direct jobs, expectations are for from 1,000 to 2,000 indirect jobs in the supplier pool that supports the shipbuilding operations.

KVAERNER COMMERCIAL SHIPBUILDING PHILOSOPHY

The creation of the Kvaerner Philadelphia Shipyard marked the first real presence in the United States of a foreign shipbuilder, ready to implement facilities, processes, tooling, and technology that have proven successful in competing for world markets. The Kvaerner endeavor will be closely watched to see if the United States can once again become competitive in the international shipbuilding market. This section addresses how Kvaerner's shipbuilding philosophy differs from that of the major private U.S. shipyards.

Most U.S. shipyards, particularly the so-called "first tier" yards,³ have evolved largely molded by their principal customer, the U.S.

Table 9.1

Projected Kvaerner Employment in 2003

Function	Kvaerner Employees	Subcontractors	Total
Steel Production	341	6	347
Painting	—	81	81
Outfitting	169	210	379
Administration	90	—	90
Engineering	40	20	60
Indirect	80	—	80
Total	720	317	1,037

²The original Master Agreement contained a clause that requires Kvaerner to pay the PSDC an amount equal to \$20,000 for each job that falls below the minimum average of 500 full-time positions per year during the Initial Operating Period (October 2003 to October 2013).

³The "first tier" yards consist of the largest yards: Newport News Shipbuilding, Electric Boat, Bath Iron Works, and National Steel and Shipbuilding Company (all owned by General Dynamics) and Ingalls and Avondale (owned by Litton Industries).

government. Starting early in the last decade of the Cold War, new construction in these shipyards has been essentially all for the U.S. Navy. Over these years, the yards have tailored facilities, processes, tooling, and technology to suit the needs of their primary customer.

Although the U.S. Navy has accepted these initiatives as meeting its specifications and price expectations, there does not exist the same competitive atmosphere that drives shipbuilding in world commercial markets. Consequently, it has proven difficult for the major U.S. yards to compete in the world market.

There is a niche in the Jones Act and Passenger Vessel Services Act markets, as described earlier, for ships engaged in trade between U.S. ports. Those Acts require the construction of these ships in U.S. shipyards. Ship owners in those markets have been very leery of building in U.S. yards because of potentially high prices and late deliveries. This is in spite of the fact that the ships in those trades are aging and in need of replacement. This reluctance by the owners was exacerbated by the problems that the largest first-tier shipyard, Newport News Shipbuilding, had with its "Double Eagle" project to build relatively simple product-sized tankers. The industry now is watching Ingalls as it begins to build two large, complex, cruise ships and the National Steel and Shipbuilding Company as it has signed contracts to build product tankers and roll-on/roll-off cargo ships.

The shipbuilding division of Kvaerner AG—in particular, its Kvaerner Masa Yards and Warnow Yard—has been very successful delivering competitively priced ships to the world market. This success can be attributed to several factors, not necessarily limited to Kvaerner and Europe that can be thought of as the "European Model."

This model becomes very relevant when comparing U.S. shipbuilding with the rest of the world because our wage rates are most comparable with those found in Europe. Therefore, U.S. shipyards must seek to increase their productivity to decrease the total cost of labor. Each of the factors discussed below enhances yard productivity.

Multiskilled Workforce

In the Kvaerner system, workers are trained to handle a variety of related skills and are expected to work cooperatively with other

craftsmen. This concept is vastly different from the traditional strict union job boundaries in U.S. shipyards. The overall concept at Kvaerner is to develop a flexible workforce in which an individual who is expert in one area is trained to be a generalist capable of working in several related areas. Process, or work, teams are composed of these multiskilled workers with each team responsible for one segment of the overall construction process. This approach has been fully supported by the Metal Trades Council, the shipyard's single union.

Just-in-Time Delivery of Material

To maximize efficiency and minimize the necessity for the storage of large amounts of material, European yards have adopted the practice of "just-in-time" deliveries of material, from steel plates to main propulsion machinery. Special relationships have been established with suppliers to ensure careful adherence to delivery schedules (in Philadelphia, Kvaerner has established such a relationship with Prime Plate Enterprises, Inc., another new tenant at the shipyard). In the case of steel plates at the Kvaerner Masa Yard in Helsinki, the mill provides plates cut to specified size, prepped for welding and painted with a "weld-through" primer. The plate storage yard in Finland is a fraction of the dimensions of typical plate storage yards in the United States.

Material Flow

While it is common practice for U.S. yards to employ facilities geared toward efficient flow of steel pieces and fabricated parts, Kvaerner Philadelphia has carried the concept to new levels. By taking the best in facility design from all its yards (particularly Masa and Warnow) and by employing lessons learned, it has designed and constructed a steel fabrication facility from scratch that might rightfully claim to be the best in the world. Designed originally to accommodate a throughput of 25,000 tons of steel per year, changes made during construction of the facility now make it possible to handle a throughput of 40,000 tons per year.

Automation

Based on its experience in Europe, Kvaerner has learned that over-automation can be counterproductive. The Philadelphia yard has been automated only where necessary to enhance the efficiency of the operation. This intelligent use of automation has made it possible for insertion of manual fitting and welding where it can do the most good.

Modular Construction, Preoutfitting, and Outfitting

Kvaerner has benefited from experience in its other yards and has applied this knowledge to the design of the Philadelphia facilities to optimize the design and procedure for assembly and outfitting of ship modules/blocks. Provision has been made to assemble steel pieces in the fabrication facility, move them to a large hall for assembly into modules, and transfer the modules by a 600-ton gantry crane into the drydock. Preoutfitting and outfitting proceed as the modules and blocks take shape. For the initial build of container ships, a very high percentage of outfitting will be accomplished sequentially, in the fabrication facility, the assembly hall, and under the gantry crane, before the large blocks are moved to the drydock.

Use of Prefabricated Components

Kvaerner makes maximum use of prefabricated parts and components. U.S. yards employ sheet metal workers and extensive tooling in a separate facility to manufacture ventilation ducting and joiner bulkheads, doors, and overheads. Kvaerner will use prefabricated, circular, insulated ventilation ducting and prefabricated joiner bulkhead panels. It also uses prefabricated joiner doors and ceiling panels. These are assembled into crew and passenger staterooms. Modular, prefabricated washrooms and heads that are prepiped and prewired are also widely used.

Outsourcing Work to Subcontractors

The most effective productivity-enhancing factor employed by Kvaerner is the maximum use of subcontractors, who are tasked to

perform a series of specific tasks in a specific geographic area, on a "turnkey" basis.

For instance, the outfitting of the bridge is turned over to a contractor who specializes in the integration of ship control and navigation equipment. The contractor is responsible for the purchase, installation, and test of all the bridge equipment, components, and furnishings. He will agree to a start and completion date that is integral with the overall schedule for the total ship construction.

Similarly, the galley and messing areas are turned over to a turnkey contractor. In fact, the entire electrical installation from generators to switchgear to switchboards to loads is turned over to a specialized electrical contractor.

The European approach to ship construction relies on subcontractors to accomplish as much as 70 percent of the labor hours. A network of qualified subcontractors has evolved to meet the needs of the European shipbuilders.

Prognosis

The Kvaerner Philadelphia Shipyard is well equipped to employ the "European Model." The facilities to implement the productivity-enhancing items discussed above exist. The labor force is receiving, and will receive as it builds up, adequate training to utilize these facilities under the aegis of European managers.

What remains to be fully implemented is a network of subcontractors fully able to take on the large tasks of providing 70 percent of the labor and material on a turnkey basis that it takes to build a ship. Fortunately, Kvaerner Philadelphia is beginning with the construction of container ships, with relatively straightforward outfitting. The construction of more complex ships, such as cruise ships, will require the full network, efficiently managed and supported locally. This network is the key to a successful shipyard on the "European Model."

THE FUTURE

As mentioned, the story of the reuse of the PNSY is not complete. One of the problems we had in constructing the story was keeping

pace with the almost daily changes, especially regarding the new tenants at the shipyard and the status of the Kvaerner effort. Undoubtedly, further changes and actions not covered in this report will have taken place by the time it is published.

What we have come away with is the feeling that the old PNSY has not passed quietly into history. It has been reborn and offers exciting opportunities and promises for the city of Philadelphia, the surrounding region, and the country as a whole. Much will depend on the outcome of the Kvaerner effort to develop a modern commercial shipbuilding industry in the United States. If this effort is successful, there is the promise that the major U.S. shipbuilding firms that rely almost exclusively on building ships for the U.S. Navy will be able to streamline their production processes and once again be a factor in the commercial shipbuilding marketplace.

Appendix A

**SHIPS BUILT AT THE PHILADELPHIA
NAVAL SHIPYARD¹**

Table A.1
Federal Street Navy Yard (1801–1876)

Ship Name	Type	Class	Launch Date
<i>Franklin</i>	Ship-of-the-line		1815
<i>North Carolina</i>	Ship-of-the-line		1820
<i>Dolphin</i>	Schooner		1821
<i>Vandalia</i>	18-gun sloop of war	<i>Boston</i>	1828
<i>Relief</i>	Store ship		1836
<i>Pennsylvania</i>	Ship-of-the-line		1837
<i>Dale</i>	Sloop-of-war		1839
<i>Mississippi</i>	Sidewheel steamer		1841
<i>Raritan</i>	Frigate		1843
<i>Princeton</i>	Screw steamer		1843
<i>Germantown</i>	Sloop-of-war		1846
<i>Susquehanna</i>	Screw steamer		1850
Light Ship #2			1855
Light Ship #1			1855
<i>Wabash</i>	Screw frigate	<i>Colorado</i>	1855
Light Ship #3			1857
<i>Shubrick</i>	Lighthouse steamer		1857
Light Ship #4			1858
Light Ship #5			1858
<i>Lancaster</i>	Screw sloop-of-war		1858
<i>Wyoming</i>	Steam sloop-of-war	<i>Wyoming</i>	1859

¹Compiled in Ahearn (2000, pp. 39–51). U.S. Navy, NAVSEA (1996), contains a slightly different list of ships constructed at the Philadelphia Naval Shipyard.

Table A.1—continued

Ship Name	Type	Class	Launch Date
<i>Pawnee</i>	Screw sloop		1859
<i>Miami</i>	Sidewheel, double-ender gunboat		1861
<i>Juniata</i>	Steam sloop-of-war		1862
<i>Monongahela</i>	Barkentine-rigged screw sloop-of-war		1862
<i>Tacony</i>	Double-ended, sidewheel steamer		1863
<i>Kansas</i>	Gunboat		1863
<i>Yantic</i>	Screw gunboat	<i>Nipsic</i>	1864
<i>Tonawanda</i>	Double-turreted coastal monitor		1864
<i>Omaha</i>	Screw sloop	<i>Serapis</i>	1864
<i>Swatara</i>	Screw sloop		1865
<i>Neshaminy</i>	Screw frigate ^a		1865
<i>Pushmataha</i>			1868
renamed	Screw sloop		
<i>Shackamaxon</i>	Ironclad		1875
<i>Quinnebaug</i>	Screw corvette		1875

^aNever commissioned.Table A.2
League Island Yard (1876–1996)

Ship Name	Type	Class	Launch Date
<i>Henderson</i>	Transport		1916
<i>Sandpiper</i>	Minesweeper	<i>Lapwing</i>	1919
<i>Vireo</i>	Minesweeper	<i>Lapwing</i>	1919
<i>Willet</i>	Minesweeper	<i>Lapwing</i>	1919
<i>Relief</i>	Hospital ship		1919
<i>Dobbin</i>	Destroyer tender		1921
<i>Minneapolis</i>	Cruiser	<i>New Orleans</i>	1933
<i>Aylwin</i>	Destroyer	<i>Farragut</i>	1934
<i>Cassin</i>	Destroyer	<i>Mahan</i>	1935
<i>Shaw</i>	Destroyer	<i>Mahan</i>	1935
<i>Roger B. Taney</i>	Cutter	<i>Secretary</i>	1936
<i>Duane</i>	Cutter	<i>Secretary</i>	1936
<i>Ingham</i>	Cutter	<i>Secretary</i>	1936
<i>Campbell</i>	Cutter	<i>Secretary</i>	1936
<i>Philadelphia</i>	Cruiser	<i>Brooklyn</i>	1936
<i>Wichita</i>	Cruiser	<i>Wichita</i>	1937
<i>Rhind</i>	Destroyer	<i>Benham</i>	1938
YC 695	Turret barge		1939

Table A.2—continued

Ship Name	Type	Class	Launch Date
<i>Buck</i>	Destroyer	<i>Sims</i>	1939
<i>Washington</i>	Battleship	<i>North Carolina</i>	1940
AVC-1	Catapult lighter		1941
PT7	Patrol torpedo boat ^a		1941
PT8	Patrol torpedo boat ^b		1941
<i>Terror</i>	Mine layer	<i>Terror</i>	1941
<i>Butler</i>	Destroyer	<i>Gleaves</i>	1942
<i>Gherardi</i>	Destroyer	<i>Gleaves</i>	1942
<i>Andres</i>	Destroyer escort	<i>Evarts</i>	1942
<i>Drury</i>	Destroyer escort	<i>Evarts</i>	1942
LST-319	Tank landing ship		1942
LST-320	Tank landing ship		1942
LST-321	Tank landing ship		1942
LST-322	Tank landing ship		1942
LST-323	Tank landing ship		1942
LST-324	Tank landing ship		1942
LST-325	Tank landing ship		1942
LST-326	Tank landing ship		1942
<i>New Jersey</i>	Battleship	<i>Iowa</i>	1942
LST-327	Tank landing ship		1943
LST-328	Tank landing ship		1943
LST-329	Tank landing ship		1943
LST-330	Tank landing ship		1943
LST-331	Tank landing ship		1943
LST-332	Tank landing ship		1943
<i>Burke</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Francis M. Robinson</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Darby</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Enright</i>	Destroyer escort	<i>Buckley</i>	1943
<i>J. Douglas Blackwood</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Coolbaugh</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Solar</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Fowler</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Spagenberg</i>	Destroyer escort	<i>Buckley</i>	1943
<i>Currituck</i>	Seaplane tender	<i>Currituck</i>	1943
<i>Rudderow</i>	Destroyer escort	<i>Rudderow</i>	1943
<i>Day</i>	Destroyer escort	<i>Rudderow</i>	1943
<i>Wisconsin</i>	Battleship	<i>Iowa</i>	1943
<i>Crosley</i>	Destroyer escort	<i>Crosley</i>	1944
<i>Cread</i>	Destroyer escort	<i>Crosley</i>	1944
<i>Ruchamkin</i>	Destroyer escort	<i>Crosley</i>	1944

Table A.2—continued

Ship Name	Type	Class	Launch Date
<i>Kirwin</i>	Destroyer escort	<i>Rudderow</i>	1944
<i>Antietam</i>	Aircraft carrier	<i>Essex</i>	1944
<i>Los Angeles</i>	Cruiser	<i>Baltimore</i>	1944
<i>Chicago</i>	Cruiser	<i>Baltimore</i>	1944
<i>Valley Forge</i>	Aircraft carrier	<i>Ticonderoga</i>	1944
<i>San Marcos</i>	Dock landing ship	<i>Casa Grande</i>	1945
<i>Princeton</i>	Aircraft carrier	<i>Essex</i>	1945
<i>Dahlgren</i>	Guided missile frigate	<i>Coontz</i>	1960
<i>William V. Pratt</i>	Guided missile frigate	<i>Coontz</i>	1960
<i>Okinawa</i>	Amphibious assault ship	<i>Iwo Jima</i>	1963
<i>Guadalcanal</i>	Amphibious assault ship	<i>Iwo Jima</i>	1963
<i>Guam</i>	Amphibious assault ship	<i>Iwo Jima</i>	1964
<i>New Orleans</i>	Amphibious assault ship	<i>Iwo Jima</i>	1968
<i>Newport</i>	Tank landing ship	<i>Newport</i>	1968
<i>Manitowoc</i>	Tank landing ship	<i>Newport</i>	1969
<i>Sumter</i>	Tank landing ship	<i>Newport</i>	1969
<i>Blue Ridge</i>	Amphibious command ship	<i>Blue Ridge</i>	1970

^aSent to United Kingdom under Lend-Lease as MTB-271.

^bReclassified YP-100.

Appendix B

**PHILADELPHIA NAVAL BUSINESS
CENTER TENANTS¹**

SHIPYARD

Del-San Environmental
DiNick's Sandwich Shop
Excel Welding & Industrial Supply
Kvaerner Philadelphia Shipyard
Metro Machine
Moran Towing
River Associates
Wilmington Steel Processing Company
Quaker Electric
Landmar Enterprises, Inc.

COMMERCE CENTER

Alstom Power Conversion—North American Headquarters
Biomechanics, Inc.
Bocchi Americas

¹Compiled from information provided by the PIDC.

Building 79 Incubator/Multitenant

Amsec

Gibbs & Cox

Prime Midas

Northrup Grumman

JJ McMullin

GeoCenters

PIDC

Shipyards College/Collegiate Consortium

Philadelphia Workforce Development Corporation

Friends of the Chapel of the Four Chaplains

International Cruise Terminal

Institute of Forensic Scientists

Island Instrumentation

Blurhino

Pennsylvania Department of Transportation

Northrop Grumman

My In-Laws Kitchen

Philadelphia Shipyard Development Corporation

PIDC Marketing Center

Prime Plate Enterprises, Inc.

Printcrafters

Teligent Communications

Vitetta

WHYY, Inc.

GIRARD POINT INDUSTRIAL PARK

Atlantic Packaging

Canadian Pacific Railway

Prime Plate Enterprises, Inc.

Changing World Technologies

Spectrum Arena, LLP

EAST END DISTRIBUTION CENTER

Thackray Crane

ESPN

Metro Machine

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THE END OF THE COLD WAR had a significant impact on the economy of Philadelphia, Pennsylvania. After almost two centuries of operations, the naval shipyard there was forced to close. Philadelphia was faced with the question: What would it do with the land, equipment, and buildings once the Navy had ceased to operate the yard?

After giving a brief history of the nation's first government-owned shipyard (established in 1801), the authors detail the costs to the Navy and the Philadelphia region of closing the yard and the city's hunt for a commercial tenant. The book describes the distinctly European business philosophy of the eventual tenant (Norwegian shipbuilding giant Kvaerner) and the conditions of its deal with the city. The authors conclude that the Philadelphia shipyard example should be considered by other U.S. military shipyards that might be faced with closure in the future.



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